

GL SCIENCES HPLC COLUMN CATALOG

Contents

•GL Sciences HPLC Columns' Specification	Ex3
•Column End-fitting.....	Ex6
•Column Selection Overview	Ex7
•HPLC Column Selection by USP	Ex9
•Reversed Phase Column Selection Guide	Ex13
•Reversed Phase Columns	Ex15
•Normal Phase Column Selection Guide	Ex16
•Selectivity Comparison of Reversed Phase Columns ...	Ex17
•GL Sciences' State-of-the-art HPLC Technology	Ex19
•QC, ISO	Ex21

Reversed Phase Columns

•InertSustain C18	002
•InertSustain AQ-C18	006
•InertSustainSwift C18	008
•Inertsil ODS-HL	010
•Inertsil ODS-4	012
•Inertsil ODS-3	014
•Inertsil ODS-4V, ODS-3V	016
•Inertsil ODS-SP	018
•Inertsil ODS-P	020
•Inertsil ODS-EP	022
•Inertsil ODS-80A	024
•Inertsil ODS-2	026
•Inertsil ODS	027
•InertSustain C8	028
•InertSustainSwift C8	030
•Inertsil C8-4	032
•Inertsil C8-3	034
•Inertsil C8	036
•Inertsil C4	037
•InertSustain PFP	038
•InertSustain Phenylhexyl	040
•InertSustain Phenyl	042
•Inertsil Ph-3	044
•Inertsil Ph	046
•InertSustain Cyano	048
•Inertsil WP300 C18	050
•Inertsil WP300 C8	052
•Inertsil WP300 C4	053

HILIC Columns

•InertSustain Amide	058
•Inertsil Amide	060
•Inertsil HILIC	062
•InertSustain NH2	064
•Inertsil NH2	066

Normal Phase Columns

•Inertsil Diol	072
•Inertsil SIL-100A	074
•InertSustain NH2	076
•Inertsil NH2	078
•InertSustain Cyano	080
•Inertsil CN-3	082
•Inertsil SIL-150A	084
•Inertsil WP300 SIL	085

SEC Columns

•Inertsil Diol	088
•Inertsil WP300 Diol	090

Ion Exchange Columns

•Inertsil AX	094
•Inertsil CX	096

Application Specific Columns

•Metal-Free PEEK Columns.....	100
•InertSustainBio C18	102
•InterSphere FA-1	103
•SYPRON AX-1	104
•SYPRON AX-2	105
•InterSphere Sugar-1	106
•InterSphere Sugar-2	107
•Inertsil Peptides C18	108
•Inertsil Acrolein C18	108
•Inertsil Sulfa C18	109
•Inertsil AS	109
•Corresponding Pharmacopeia (JP, USP, EP) ...	110
•Corresponding SFC	112

Guard Columns

- Guard Column's selection and Use 114
- Cartridge Guard Column E 115
- Cartridge Guard Column Ei (Non-metal type)... 116
- Guard Columns for UHPLC 118
- GL Cart 120
- Packed Guard Columns, Mini Guard Columns 121
- SILFILTER STD C18 126
- Filters, Impurity Remove Columns 127

Preparative Columns

- Choosing Preparative Columns 130
- Preparative Columns 131
- Guard Columns for Preparative Columns 136
- PREP Guard Cartridges 139

Capillary Columns

- Capillary HPLC Columns 142
- Particle type Capillary HPLC Columns..... 143
- Particle type Capillary Micro Guard Columns... 150
- Connection Kits for Capillary
EX• EX-Nano Columns 151
- Monolithic Capillary HPLC Columns..... 152

Applications

- Applications 162

Index

- Cat. No. Index 172

Reversed Phase Columns 001

HILIC Columns 059

Normal Phase Columns 071

SEC Columns 087

Ion Exchange Columns 089

Application Specific
Columns 095

Guard Columns 113

Preparative Columns 129

Capillary Columns 141

Applications 161

Cat. No. Index 172

GL Sciences HPLC Columns' Specification

	Column	Features	USP Code	Particle Size (µm)	Pore Size (nm)	Surface Area (m ² /g)
Reversed Phases	InertSustain C18	First choice with ultra high inertness and high durability	L1	2, 3, 5	10	350
	InertSustain AQ-C18	First choice for high polar compounds	L1, L96	1.9, 3, 5	10	350
	InertSustainSwift C18	First analysis with ultra high inertness and high durability	L1	1.9, 3, 5	20	200
	Inertsil ODS-HL	Ultra high retentivity, High-density bonding of C18 phase	L1	3, 5	10	450
	Inertsil ODS-4	Ultra high inertness, High plate count, Medium retentivity	L1	2, 3, 5	10	450
	Inertsil ODS-4V	Inertsil ODS-4 Validated column	L1	3, 5	10	450
	Inertsil ODS-3	Strong retentivity, Lower column backpressure, Very inert	L1	2, 3, 4, 5, 10	10	450
	Inertsil ODS-3V	Inertsil ODS-3 Validated column	L1	3, 5	10	450
	Inertsil ODS-SP	Weak retentivity, for hydrophobic compounds	L1	3, 5	10	450
	Inertsil ODS-P	High steric selectivity	L1	3, 5	10	450
	Inertsil ODS-EP	A polar functional group embedded	L1	5	10	450
	Inertsil WP300 C18	Analysis of high molecules	L1	5	30	150
	Inertsil ODS-80A	Elute low molecule with a sharp peak shape	L1	5	8	450
	Inertsil ODS-2	Ultra pure silica gel is used	L1	5	15	320
Other Reversed Phases	Inertsil ODS	Inertness 1st generation	L1	5, 10	10	350
	InertSustain C8	First choice with ultra high inertness and high durability	L7	2, 3, 5	10	350
	InertSustainSwift C8	High inertness and high durability C8 column	L7	1.9, 3, 5	20	200
	Inertsil C8-4	Ultra high inertness, High plate count, Low retentivity	L7	2, 3, 5	10	450
	Inertsil C8-3	Strong retentivity, Lower column backpressure, Very inert	L7	2, 3, 5, 10	10	450
	Inertsil C8	Ultra pure silica gel is used	L7	5	15	320
	Inertsil C4	Low retentivity	L26	5	15	320
	Inertsil WP300 C8	Suitable for high molecules	L7	5	30	150
	Inertsil WP300 C4		L26	5	30	150
	InertSustain PFP	Extremely Strong retention of highly polar basic compounds.	L43	3, 5	10	350
	InertSustain Phenylhexyl	Strong π-π interactions and hydrophobic interactions	L11	3, 5	10	350
	InertSustain Phenyl	Extremely strong π-π interactions	L11	2, 3, 5	10	350
	Inertsil Ph-3	Strong π-π interactions	L11	2, 3, 5	10	450
	Inertsil Ph	High inertness, Weak π-π interactions	L11	5	15	320
HILIC	InertSustain Amide	First choice for HILIC mode	L68	3, 5	10	350
	Inertsil Amide	Increasing retentivity of high polar compounds	L68	3, 5	10	450
	Inertsil HILIC	Separation of highly polar basic compounds	L20	3, 5	10	450
	InertSustain NH2	First choice for sugar analysis	L8	3, 5	10	350
	Inertsil NH2	Sugar analysis, High retentive in normal phase mode	L8	3, 5	10	450
Normal Phases	Inertsil Diol	First choice for normal phase mode, For SEC	L20	3, 5	10	450
	Inertsil SIL-100A	Ultra pure silica gel with 100Å pore size	L3	3, 5	10	450
	Inertsil SIL-150A	Ultra pure silica gel with 150Å pore size	L3	5	15	320
	Inertsil WP300 SIL	Ultra pure silica gel with 300Å pore size	L3	5	30	150
	InertSustain Cyano	Ultra inertness and can be used in reversed phase mode	L10	3, 5	10	350
	Inertsil CN-3	Can be also used in reversed phase mode	L10	3, 5	10	450
SEC	Inertsil WP300 Diol	High molecule SEC, Can be also used in normal phase mode	L20, L33	5	30	150
Ion-Exchange	Inertsil AX	Anion-exchange column	—	5	10	450
	Inertsil CX	Cation-exchange column	L9	5	10	450
Application Specific Columns	InertSustainBio C18	Using for the peptides and protein with 200Å pore size	L1	1.9, 3	20	200
	SYPRON AX-1	Ion exchange column for bromate analysis by LC/MS	—	5	—	—
	SYPRON AX-2	Ion exchange column for organic acid analysis by LC/MS	—	5	—	—
	InertSphere Sugar-1	Sugar analysis with ECD	—	5	—	—
	InertSphere Sugar-2	Sugar analysis with SEC and ligand exchange mode	—	5	—	—
	Inertsil Peptides C18	Peptide analysis	L1	4	10	450
	Inertsil Acrolein C18	Acrolein analysis	L1	5	10	450
	Inertsil Sulfa C18	Sulfa analysis	L1	3, 5	10	450
	Inertsil AS	Arsenic compounds analysis	L1	3	10	450
	InertSphere FA-1	Povidone impurity analysis column	L17	9	—	—
	MonoCap Series	Monolithic silica capillary column				

	Column	Carbon Loading (%)	End-Capping	Inertness	Recommended pH range
Reversed Phases	InertSustain C18	14	○	★★★★★	1 - 10
	InertSustain AQ-C18	13	○	★★★★★	1 - 10
	InertSustainSwift C18	9	○	★★★★★	1 - 10
	Inertsil ODS-HL	23	○	★★★★★	2 - 7.5
	Inertsil ODS-4	11	○	★★★★★	2 - 7.5
	Inertsil ODS-4V	11	○	★★★★★	2 - 7.5
	Inertsil ODS-3	15	○	★★★★	2 - 7.5
	Inertsil ODS-3V	15	○	★★★★	2 - 7.5
	Inertsil ODS-SP	8.5	○	★★★★	2 - 7.5
	Inertsil ODS-P	29	—	★★★	2 - 7.5
	Inertsil ODS-EP	9	—	★★★★	2 - 7.5
	Inertsil WP300 C18	9	○	★★★★	2 - 7.5
	Inertsil ODS-80A	17.5	○	★★★★	2 - 7.5
	Inertsil ODS-2	18.5	○	★★★★	2 - 7.5
Other Reversed Phases	Inertsil ODS	14	○	★★	2 - 7.5
	InertSustain C8	8	○	★★★★★	1 - 10
	InertSustainSwift C8	6	○	★★★★★	1 - 10
	Inertsil C8-4	5	○	★★★★★	2 - 7.5
	Inertsil C8-3	9	○	★★★★	2 - 7.5
	Inertsil C8	10.5	○	★★	2 - 7.5
	Inertsil C4	7.5	○	★★★★	2 - 7.5
	Inertsil WP300 C8	4	○	★★★★	2 - 7.5
	Inertsil WP300 C4	3	—	★★★★	2 - 7.5
	InertSustain PFP	10	○	★★★★★	2 - 7.5
	InertSustain Phenylhexyl	9	○	★★★★★	1 - 10
	InertSustain Phenyl	10	—	★★★★	2 - 7.5
	Inertsil Ph-3	9.5	—	★★★	2 - 7.5
	Inertsil Ph	10	○	★★★	2 - 7.5
HILIC	InertSustain Amide	15	—	—	2 - 8.5
	Inertsil Amide	18	—	—	2 - 7.5
	Inertsil HILIC	20	—	—	2 - 7.5
	InertSustain NH2	7	—	—	2 - 7.5
	Inertsil NH2	8	—	—	2 - 7.5
Normal Phase	Inertsil Diol	20	—	—	2 - 7.5
	Inertsil SIL-100A	—	—	—	2 - 7.5
	Inertsil SIL-150A	—	—	—	2 - 7.5
	Inertsil WP300 SIL	—	—	—	2 - 7.5
	InertSustain Cyano	8	○	★★★★	2 - 7.5
	Inertsil CN-3	14	—	—	2 - 7.5
SEC	Inertsil WP300 Diol	9	—	—	2 - 7.5
Ion-Exchange	Inertsil AX	17	—	—	2 - 7.5
	Inertsil CX	14	—	—	2 - 7.5
Application Specific Columns	InertSustainBio C18	9	○	★★★★★	1 - 10
	SYPRON AX-1	—	—	—	3 - 7
	SYPRON AX-2	—	—	—	—
	InertSphere Sugar-1	—	—	—	2 - 14
	InertSphere Sugar-2	—	—	—	—
	Inertsil Peptides C18	15	○	★★★★	2 - 7.5
	Inertsil Acrolein C18	9	○	★★★★	2 - 7.5
	Inertsil Sulfa C18	15	○	★★★★	2 - 7.5
	Inertsil AS	15	○	★★★	2 - 7.5
	InertSphere FA-1	—	—	—	—
	MonoCap Series	—	—	—	—



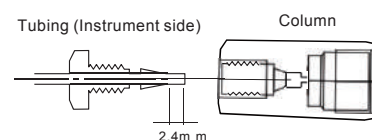
Column End-fittings

Column End-fittings

The specification of GL Sciences' end-fitting style is summarized below. The chromatographic separation and result can be negatively impacted if the style of the column end-fittings does not match the existing tubing ferrule settings.

Column Type	End-fitting
InertSustain C18, InertSustain C8, InertSustain Phenyl, Inertsil ODS-4, Inertsil ODS-3, Inertsil C8-4, Inertsil C8-3, Inertsil Ph-3, InertSustainSwift C18, InertSustainSwift C8, InertSustain Series, Inertsil Series,	Parker Style (UP Type)
InertSphere Sugar-1, InertSphere Sugar-2, InertSphere FA-1	
InertSustain AQ-C18, InertSustainSwift C18, InertSustainSwift C8	
UHPLC PEEK Columns, PEEK Columns	
SYPRON AX-1, SYPRON AX-2	
Mono Series, GL-Park Series	
Capillary EX Columns	
Capillary EX Nano Columns	
Cartridge Guard Column E, Cartridge Guard Column Ei	
Guard Column for UHPLC, GL Cart	
Packed Guard Column, Packed Mini Guard Column	
Preparative Guard Column, PREP Guard Column	
Capillary EX Micro Guard Column	

•Parker Style (UP type)



Recommended Operating Pressure

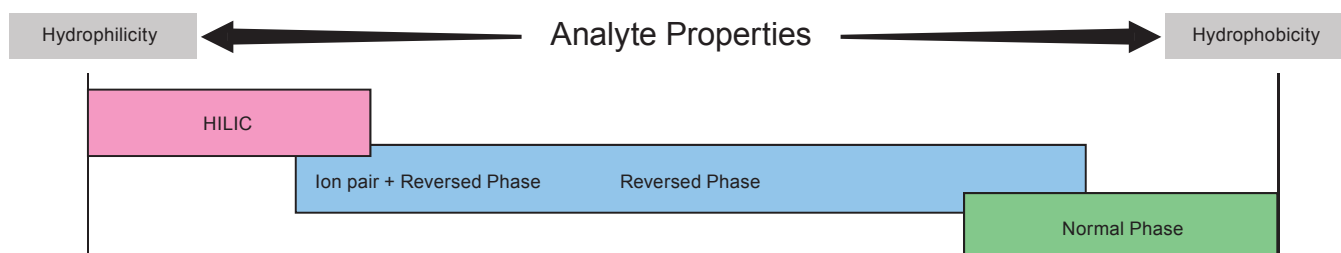
GL Sciences' HPLC columns can tolerate up to pressures shown below. Although the columns are packed by high pressure slurry method, it is recommended to keep the operating pressure under the pressure shown below to maintain peak performance and ensure long column life and stability.

Analytical Columns	End-fittings	Maximum Operating Pressure
InertSustain Series InertSustainSwift Series Inertsil Series	1.9 μ m, 2 μ m	80 MPa (800 bar)
InertSustain Series InertSustainSwift Series Inertsil Series	3 μ m HP	50 MPa (500 bar)
InertSustain Series InertSustainSwift Series Inertsil Series	3~10 μ m	20 MPa (200 bar)
InertSphere Sugar-1	5 μ m	15 MPa (150 bar)
Capillary EX Columns	3 μ m, 5 μ m	20 MPa (200 bar)
Capillary EX Nano Columns	3 μ m, 5 μ m	15 MPa (150 bar)

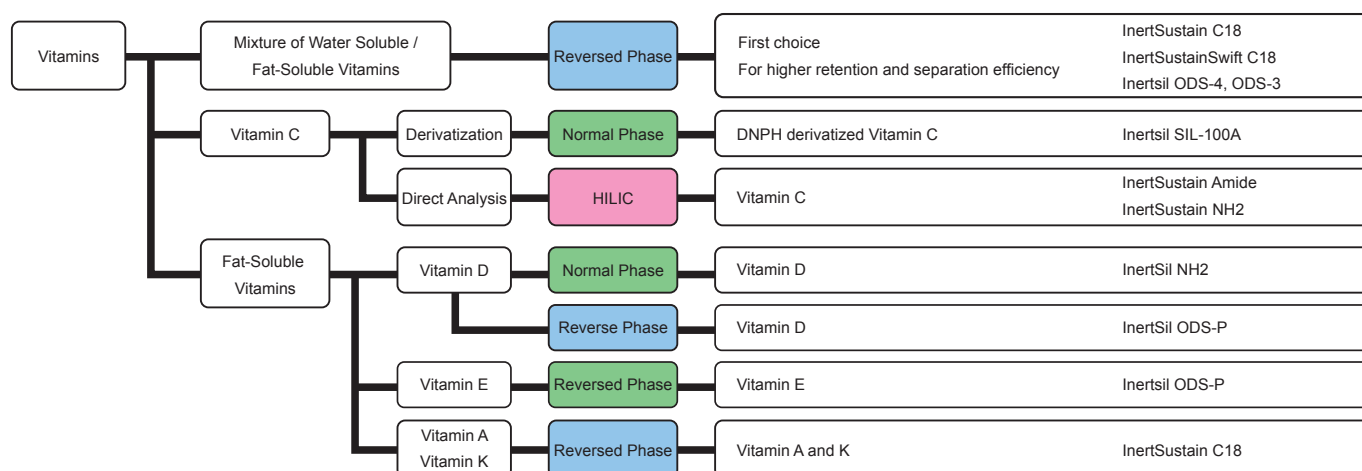
Guard Columns	Maximum Operating Pressure
Guard Column for UHPLC	80 MPa (800 bar)
Cartridge Guard Column E Cartridge Guard Column Ei GL Cart, Pre-clean ORG PREP Guard Cartridge	20 MPa (200 bar)
Packed Guard Columns Packed Mini Guard Columns Capillary Micro Guard Columns Preparative Guard Columns	20 MPa (200 bar)

Column Selection Overview

Separation Mode Selection for Analyte Polarity



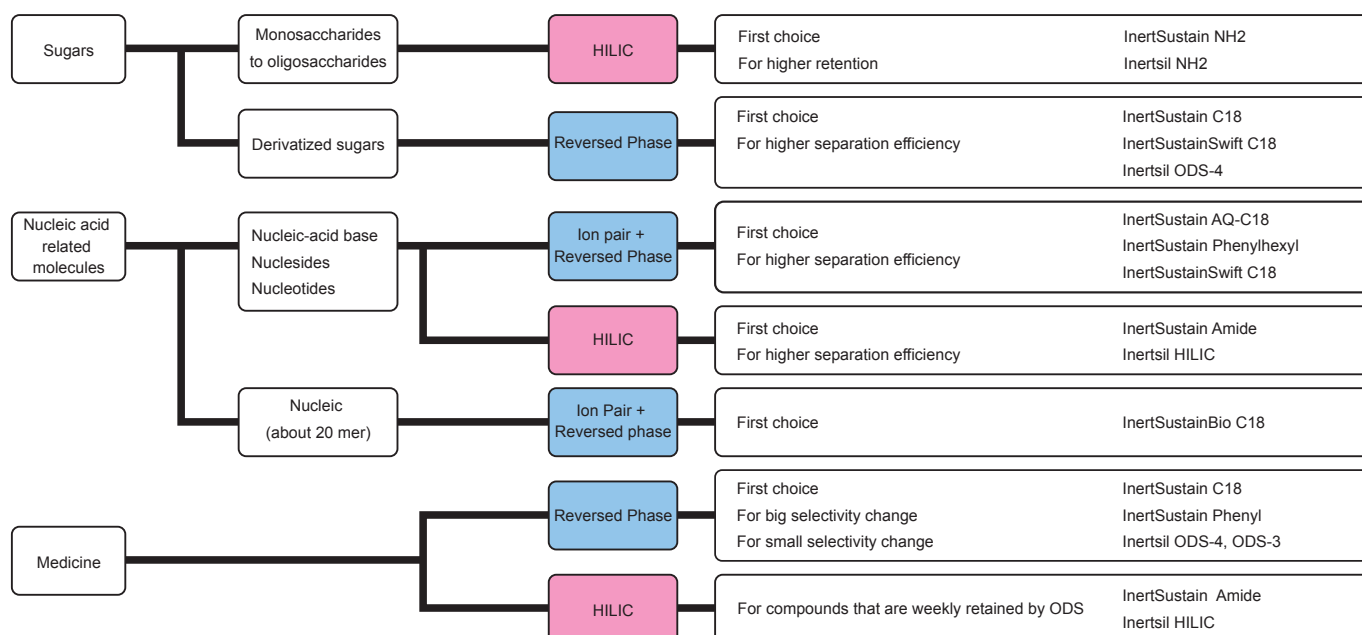
Column Selection for Analyte Properties

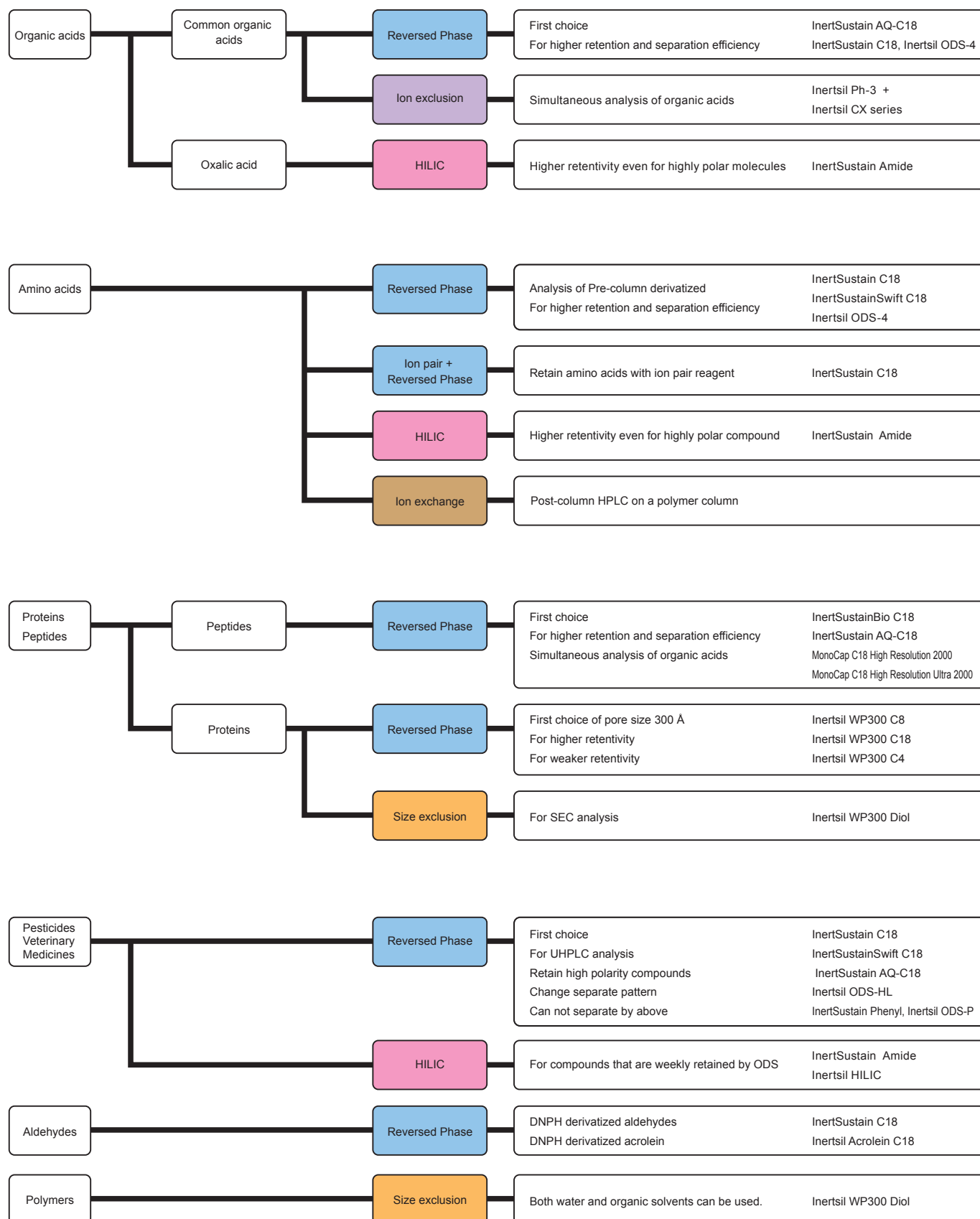


Water Soluble Vitamins	Phase	Detector
Vitamin C	NH ₂ , SIL, Amide	UV
Vitamin B ₁	ODS	UV, (FL)
Vitamin B ₂	ODS	UV, FL
Vitamin B ₆	ODS	UV
Niacin	ODS	UV
Folic acid	ODS	UV
Pantothenic acid	ODS	UV

Fat-Soluble Vitamin	Phase	Detector
Vitamin A	ODS	UV, FL
Vitamin D	ODS, NH ₂	UV
Vitamin E	ODS	UV, FL
Vitamin K	ODS	UV, (FL)

* (FL): Post-column derivatization





HPLC Column Selection by USP

USP Code	Description	Brand
L1	Octadecyl silane chemically bonded to porous or nonporous silica or ceramic microparticles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain C18 InertSustain AQ-C18 InertSustainSwift C18 Inertsil ODS-HL Inertsil ODS-4 Inertsil ODS-3 Inertsil ODS-SP Inertsil ODS-P Inertsil ODS-2 Inertsil ODS Inertsil WP300 C18
L2	Octadecyl silane chemically bonded to silica gel of a controlled surface porosity that has been bonded to a solid spherical core, 30 to 50 µm in diameter.	ECONO PREP ODS
L3	Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Inertsil SIL-100A Inertsil SIL-150A Inertsil WP300 SIL
L4	Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	ECONO PREP SIL
L5	Alumina of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	
L6	Strong cation exchange packing-sulfonated fluorocarbon polymer coated on a solid spherical core, 30 to 50 µm in diameter.	
L7	Octylsilane chemically bonded to totally porous or superficially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain C8 InertSustainSwift C8 Inertsil C8-4 Inertsil C8-3 Inertsil C8 Inertsil WP300 C8
L8	An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain NH2 Inertsil NH2
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.	Inertsil CX
L10	Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain Cyano Inertsil CN-3
L11	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain Phenylhexyl InertSustain Phenyl Inertsil Ph-3 Inertsil Ph
L12	A strong anion-exchange packing made by chemically bonding a quaternary amine to a solid silica spherical core, 30 to 50 µm in diameter.	
L13	Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	Spherisorb Methyl
L14	Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.	Nucleosil 100-SB Partisil SAX Spherisorb SAX
L15	Hexylsilane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	Spherisorb C6
L16	Dimethylsilane chemically bonded to porous silica particles, 5 to 10 µm in diameter.	
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6 to 12 µm in diameter.	InertSphere FA-1 PRP-X200, PRP-X300 HC-75(H ⁺) SUGAR SH1011, SH1821 RSpak KC-811 IC Y-521
L18	Amino and cyano groups chemically bonded to porous silica particles, 3 to 10 µm in diameter.	Partisil 5 PAC Partisil 10 PAC
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9 µm in diameter.	HC-75(Ca ²⁺) SUGAR SC1011, SC1821 SUGAR SC1211
L20	Dihydroxypropane groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Inertsil Diol Inertsil WP300 Diol PROTEIN KW-800 series
L21	A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter.	PRP-1, PRP-3 GPC KF-801 RSpak DS-413, DS-613 RSpak RP18-415
L22	A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10 µm in size.	PRP-X200, PRP-X300 SUGAR SH1011, SH1821 RSpak KC-811 SUGAR SP0810 SUGAR SC1011, SC1821 SUGAR SZ5532 SUGAR KS800 series IC Y-521

USP Code	Description	Brand
L23	An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 7 - 12 µm in size.	PRP-X500 IEC QA-825
L24	Polyvinylalcohol chemically bonded to porous silica particle, 5 µm in diameter.	
L25	Packing having the capacity to separate compounds with a molecular weight range from 100-5000 (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable.	OHpak SB-802 HQ OHpak SB-802.5 HQ
L26	Butyl silane chemically bonded to totally porous or superficially porous silica particles, 1.5 to 10 µm in diameter.	Inertsil C4 Inertsil WP300 C4
L27	Porous silica particles, 30 to 50 µm in diameter.	
L28	A multifunctional support, which consists of a high purity, 100 Å, spherical silica substrate that has been bonded with anionic exchanger, amine functionality in addition to a conventional reversed phase C8 functionality.	
L29	Gamma alumina, reverse-phase, low carbon percentage by weight, alumina-based polybutadiene spherical particles, 5 µm in diameter with a pore volume of 80 Å.	
L30	Ethyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	
L31	A hydroxide-selective, strong anion-exchange resin-quaternary amine bonded on latex particles attached to a core of 8.5 µm macroporous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene.	
L32	A chiral ligand exchange packing-L-proline copper complex covalently bonded to irregularly shaped silica particles, 5 to 10 µm in diameter.	CHIRALPAK WH
L33	Packing having the capacity to separate dextrans by molecular size over a range of 4,000 to 500,000 Da. It is spherical, silica-based, and processed to provide pH stability.	Inertsil WP300 Diol PROTEIN KW-800 series
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, 7 to 9 µm in diameter.	HC-75(Pb ²⁺) SUGAR SP0810
L35	A zirconium-stabilized spherical silica packing with a hydrophilic (diol-type) molecular monolayer bonded phase having a pore size of 150 Å.	
L36	A 3,5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to 5 µm aminopropyl silica.	SUMICHIRAL OA-2000
L37	Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel.	OHpak SB-803 HQ
L38	A methacrylate-based size exclusion packing for water-soluble samples.	OHpak SB-800 HQ series
L39	A hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin.	OHpak SB-800 HQ series RSpak DM-614
L40	Cellulose tris-3,5-dimethylphenylcarbamate coated porous silica particles, 5 to 20 µm in diameter.	CHIRALCEL OD series
L41	Immobilized α1-acid glycoprotein on spherical silica particles, 5 µm in diameter.	CHIRALPAK AGP
L42	Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5 µm in diameter.	
L43	Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 µm in diameter.	
L44	A multifunctional support, which consists of a high purity, 60 Å, spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a conventional reversed phase C8 functionality.	
L45	Beta cyclodextrin, R,S-hydroxypropyl ether derivative, bonded to porous silica particles, 3 to 10 µm in diameter.	ORpak CDBS-453 SUMICHIRAL OA7000 SUMICHIRAL OA7100
L46	Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, about 9 to 11 µm in diameter.	
L47	High capacity anion-exchange microporous substrate, fully functionalized with trimethylamine groups, 8 µm in diameter.	PRP-X100, PRP-X110 RCX-10, RCX-30
L48	Sulfonated, cross-linked polystyrene with an outer layer of submicron, porous, anion-exchange microbeads, 5 to 15 µm in diameter.	
L49	A reversed phase packing made by coating a thin layer of polybutadiene onto spherical porous zirconia particles, 3 to 10 µm in diameter.	
L50	Multifunction resin with reversed-phase retention and strong anion-exchange functionalities. The resin consists of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 µm in diameter, and a surface area not less than 350 m ² /g. Substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.	
L51	Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10 µm in diameter.	CHIRALPAK AD series
L52	A strong cation-exchange resin made of porous silica with sulfopropyl groups, 5 to 10 µm in diameter.	
L53	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 µm diameter. Substrate is surface grafted with carboxylic acid and/or phosphoric acid functionalized monomers. Capacity not less than 500 µEq/column.	
L54	A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13 µm in diameter.	
L55	A strong cation-exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5 µm in diameter.	IC-Pak Cation M/D
L56	Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	

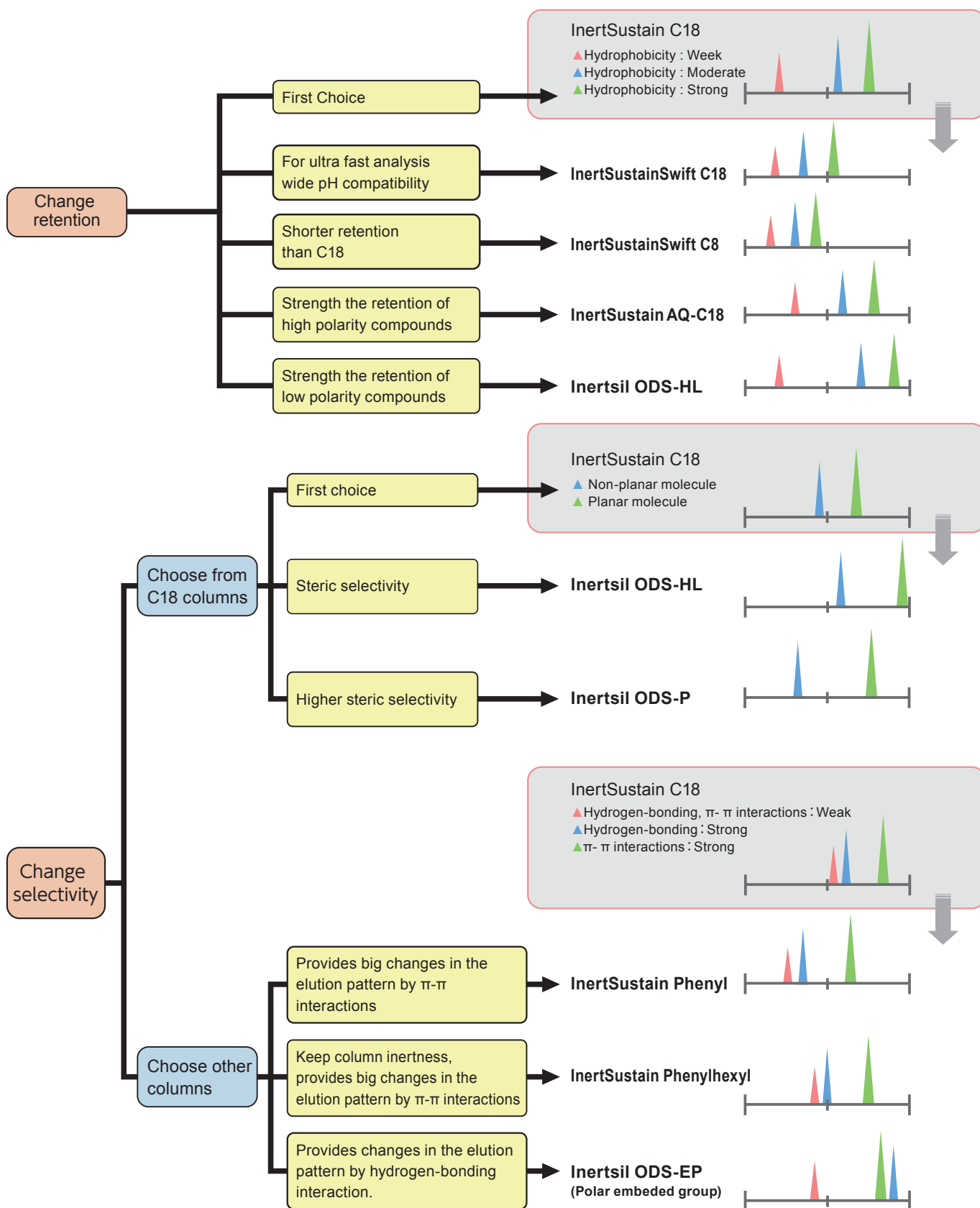
HPLC Column Selection by USP

USP Code	Description	Brand
L57	A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5 µm in diameter, with a pore size of 120 Å.	
L58	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the sodium form, about 6 to 30 µm diameter.	SUGAR KS 800 series CXpak P-421S
L59	Packing for the size-exclusion separation of proteins (separation by molecular weight) over the range of 5 to 7,000 kDa. The packing is a spherical 1.5 to 10 µm silica of hybrid packing with a hydrophilic coating.	PROTEIN KW-803
L60	Spherical, porous silica gel, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and endcapped.	
L61	A hydroxide selective strong anion-exchange resin consisting of a highly cross-linked core of 13 µm microporous particles having a pore size less than 10 Å units and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 85 nm diameter microbeads bonded with alkanol quaternary ammonium ions (6 %).	
L62	C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter.	
L63	Glycopeptide teicoplanin linked through multiple covalent bonds to a 100-Å units spherical silica.	SUGAR KS 800 series
L64	Strongly basic anion-exchange resin consisting of 8 % cross-linked styrene-divinylbenzene copolymer with a quaternary ammonium group in the chloride form, 45 to 180 µm in diameter.	
L65	Strongly acidic cation-exchange resin consisting of 2 % sulfonated cross-linked styrene-divinylbenzene copolymer with a sulfonic acid group in the hydrogen form, 45 to 250 µm in diameter.	
L66	A crown ether coated on a 5 µm particle size silica gel substrate. The active site is (S)-18-crown-6-ether.	Crownpak CR (+)
L67	Porous vinyl alcohol copolymer with a C18 alkyl group attached to the hydroxyl group of the polymer, 2 to 10 µm in diameter.	Asahipak ODP-40 Asahipak ODP-50 Shodex ET-RP1
L68	Spherical, porous silica, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped.	InertSustain Amide Inertsil Amide
L69	Ethylvinylbenzene/divinylbenzene substrate agglomerated with quaternary amine functionalized 130 nm latex beads, about 6.5 µm in diameter.	
L70	Cellulose tris(phenyl carbamate) coated on 5 µm silica.	CHIRALCEL OC-H SUMICHIRAL OA-3300
L71	A rigid, spherical polymetacrylate, 4 to 6 µm in diameter.	RSpak DE-213, DE-413 RSpak DE-613
L72	(S)-phenylglycine and 3,5-dinitroaniline urea linkage covalently bonded to silica.	SUMICHIRAL OA-3300
L73	A rigid spherical polydivinylbenzene particle, 5 to 10 µm in diameter.	
L74	A strong anion-exchange resin consisting of a highly cross-linked core of 7 µm macroporous particles having a 100 Å average pore size and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene and an anion-exchange layer grafted to the surface, which is functionalized with alkyl quaternary ammonium ions.	
L75	A chiral-recognition protein, bovine serum albumine (BSA), chemically bonded to silica particles, about 7 µm in diameter, with a pore size of 300 Å.	
L76	Silica based weak cation-exchange material, 5 µm in diameter. Substrate is surface polymerized polybutadiene-maleic acid to provide carboxylic acid functionalities. Capacity not less than 29 µEq/column.	
L77	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 6 to 9 µm diameter. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 500 µEq/column (4 mm × 25 cm)	
L78	A silane ligand that consists of both reversed phase (an alkyl chain longer than C8) and anion-exchange (primary, secondary, or tertiary amino groups) functional groups chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.0 to 50 µm in diameter, or a monolithic rod.	
L79	A chiral-recognition protein, human serum albumin (HSA), chemically bonded to silica particles, about 5 µm in diameter.	CHIRALPAK HSA
L80	Cellulose tris(4-methylbenzoate)-coated, porous, spherical, silica particles, 5 to 20 µm in diameter.	CHIRALCEL OJ CHIRALCEL OJ-H
L81	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 9 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 70 nm diameter microbeads (6 % crosslinked) bonded with alkanol quaternary ammonium ions.	
L82	Polyamine chemically bonded to cross-linked polyvinyl alcohol polymer, 5 µm in diameter.	Asahipak NH2P-40 Asahipak NH2P-50 apHera NH2 Amino
L83	A hydroxide-selective, strong anion-exchange resin-quaternary amine bonded on latex particles attached to a core of 10.5 µm microporous particles of 10 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene.	
L84	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 5 µm in diameter. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 8400 µEq/column (5 mm × 25 cm).	
L85	A silane ligand that consists of both reversed phase (an alkyl chain longer than C8) and weak cation-exchange (carboxyl groups) functional groups chemically bonded to porous or non-porous particles, 1.0 to 50 µm in diameter.	

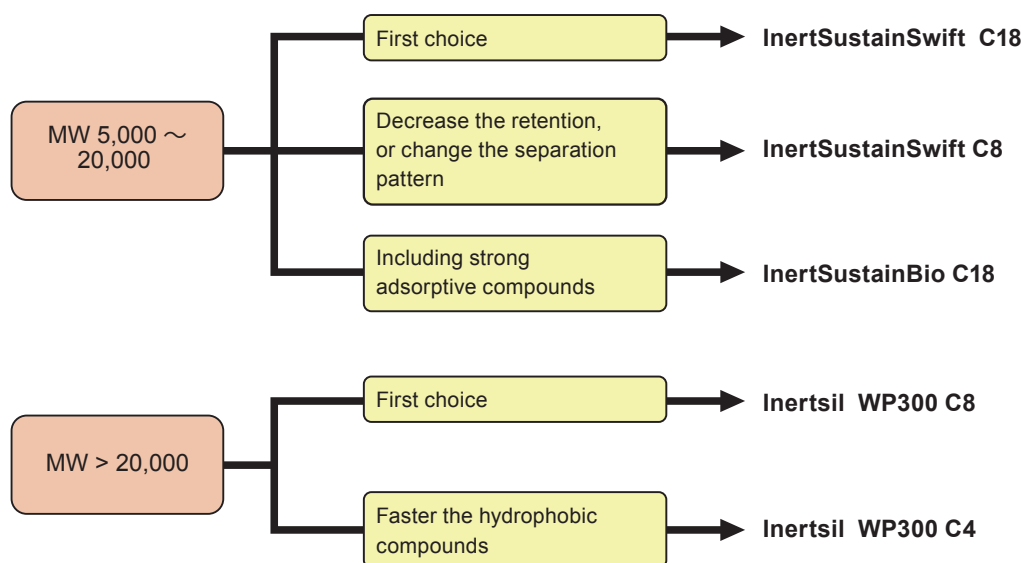
USP Code	Description	Brand
L86	A 5 µm fused core particle with a highly polar ligand possessing 5 hydroxyl groups tethered to the silica gel outer layer.	
L87	Dodecyl silane chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	
L88	Glycopeptide vancomycin linked through multiple covalent bonds to 100 Å spherical silica.	
L89	Packing having the capacity to separate compounds with a molecular weight range from 100 - 3000 (as determined by polyethylene oxide), applied to neutral and anionic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contains some residual cationic functional groups).	
L90	Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter.	
L91	Strong anion-exchange resin consisting of monodisperse porous polystyrene/divinyl benzene beads coupled with quaternary amine. Bead size is 3 to 10 µm.	
L92	A strong anion-exchange resin consisting of highly cross-linked 5 to 9 µm macroporous particles having a 100-Å average pore size and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene and an anion-exchange layer grafted to the surface, which is functionalized with alkanol quaternary ammonium ions.	
L93	Cellulose tris(3,5-dimethylphenylcarbamate) reversed phase chiral stationary phase coated on 3 or 5 µm silica gel particles.	CHIRALCEL OD-3R CHIRALCEL OD-RH
L94	A strong anion-exchange resin consisting of a highly crosslinked 15 µm microporous particles functionalized with very low crosslinked latex (0.5 %) to provide alkanol quaternary ammonium ion exchange sites.	
L95	A highly polar alkyl ligand comprising five hydroxyl groups that are chemically bonded to totally porous or superficially porous silica or a monolithic silica rod.	
L96	Alkyl chain, reversed-phase bonded totally or superficially porous silica designed to retain hydrophilic and other polar compounds when using highly aqueous mobile phases, including 100 % aqueous, 1.5 µm to 10 µm.	InertSustain AQ-C18
L97	Weak cation-exchange resin consisting of a highly cross-linked core of 5.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 2400 µEq/column (4 mm x 25 cm).	
L98	Weak cation-exchange resin consisting of a highly cross-linked core of 8.0- µm microporous particles having an average pore size of 10 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity of NLT 46 µEq/column (4-mm x 5-cm).	
L99	Amylose tris-(3,5)-dimethylphenylcarbamate), immobilized on porous, spherical, silica particles, 3 to 5 µm in diameter.	CHIRALPAK IA CHIRALPAK IA-3
L100	A 55 % crosslinked, microporous, hydrophobic resin core (9 µm microporous particles having a pore size of 10 Å) that consists of a bilayer of anion and cation exchange latex. The first layer is fully sulfonated latex (140 nm) and the second layer is fully aminated latex (76 nm).	
L101	Cholesteryl groups chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod.	
L102	(Naproxen, [S,S] Whelk-O 1) - 1-(3,5-dinitrobenzamido)-1,2,3,4-tetrahydrophenanthrene covalently bonded to porous spherical silica particles, 5 to 10 µm in diameter.	
L103	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 7.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene electrostatically bonded with hyperbranched alkanol quaternary ammonium ions.	
L104	Triazole groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	
L105	A strong anion-exchange resin consisting of a highly cross-linked 9 µm supermacroporous (2000 Å) particles functionalized with very low cross-linked latex (0.2 %) to provide alkyl quaternary ammonium ion sites.	
L106	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 5 to 8 µm diameter, macroporous particles having an average pore size of 100 Å. Substrate is surface grafted with carboxylic acid and phosphonic acid functional groups. Capacity not less than 2800 µEq/column (4 mm x 25 cm).	
L107	Cellulose tris(4-methylbenzoate)-coated porous spherical particles, 3 to 5 µm in diameter, for use with reversed phase mobile phases.	CHIRALCEL OJ-RH
L108	A chiral-recognition protein, cellobiohydrolase (CBH), chemically bonded to silica particles, about 5 µm in diameter.	CHIRALPAK CBH
L109	Spherical particles of porous graphitic carbon, 3 to 30 µm in diameter.	
L110	A strong anion-exchange resin consisting of a highly cross-linked 13 µm microporous (less than 10 Å) particles coated with very low cross-linked latex (0.5 %) to provide alkanol quaternary ammonium ion exchange sites.	
L111	Polyamine chemically bonded to porous spherical silica particles, 5 µm in diameter.	
L112	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 8.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene with a latex coating composed of 65 nm diameter microbeads (5 % cross-linked) bonded with alkanol quaternary ammonium ions.	
L113	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 7.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 65 nm diameter microbeads (8 % cross-linked) bonded with alkanol quaternary ammonium ions.	

Reversed Phase Column Selection Guide

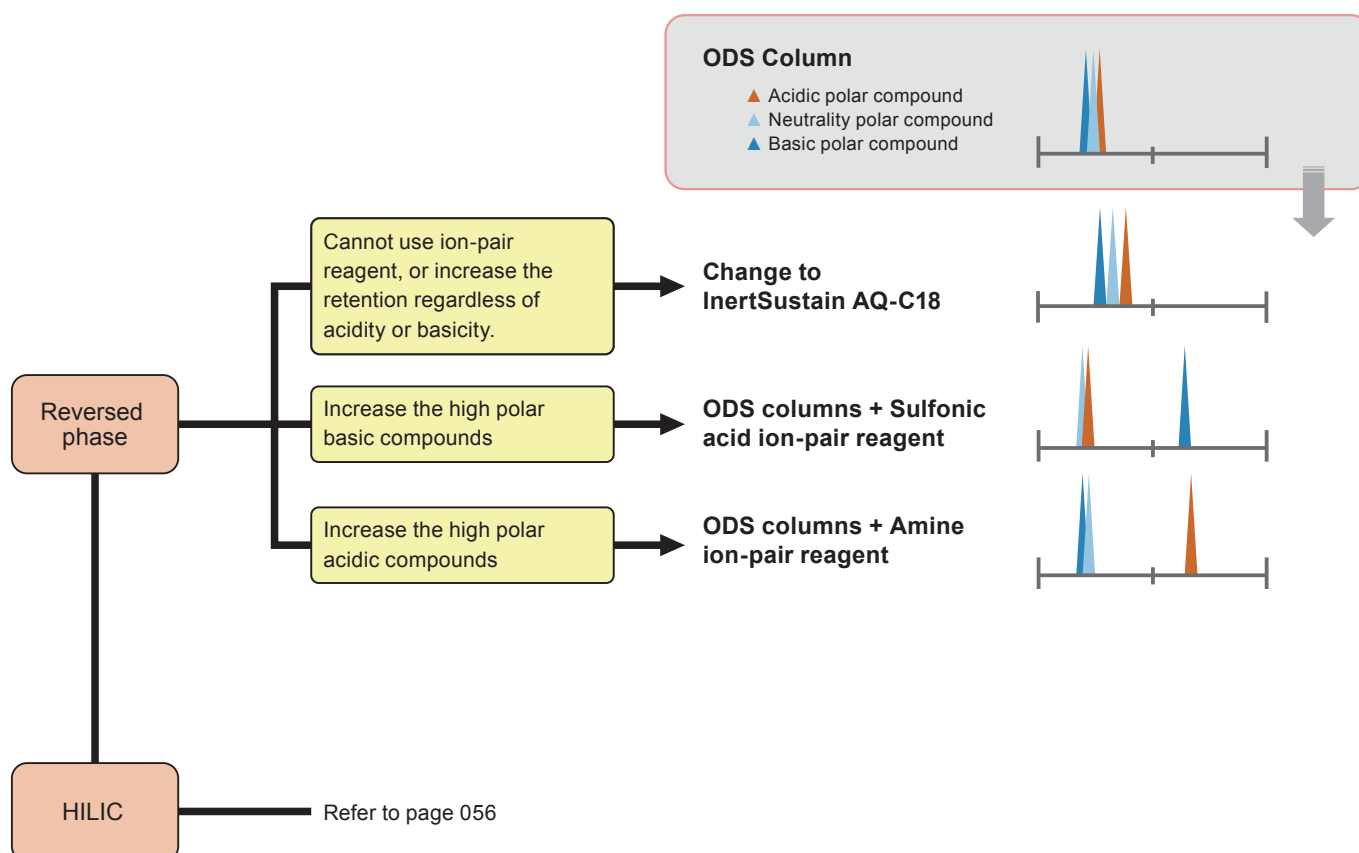
Molecular Weight <5,000



Molecular Weight >5,000



Analyze High Polar Compounds

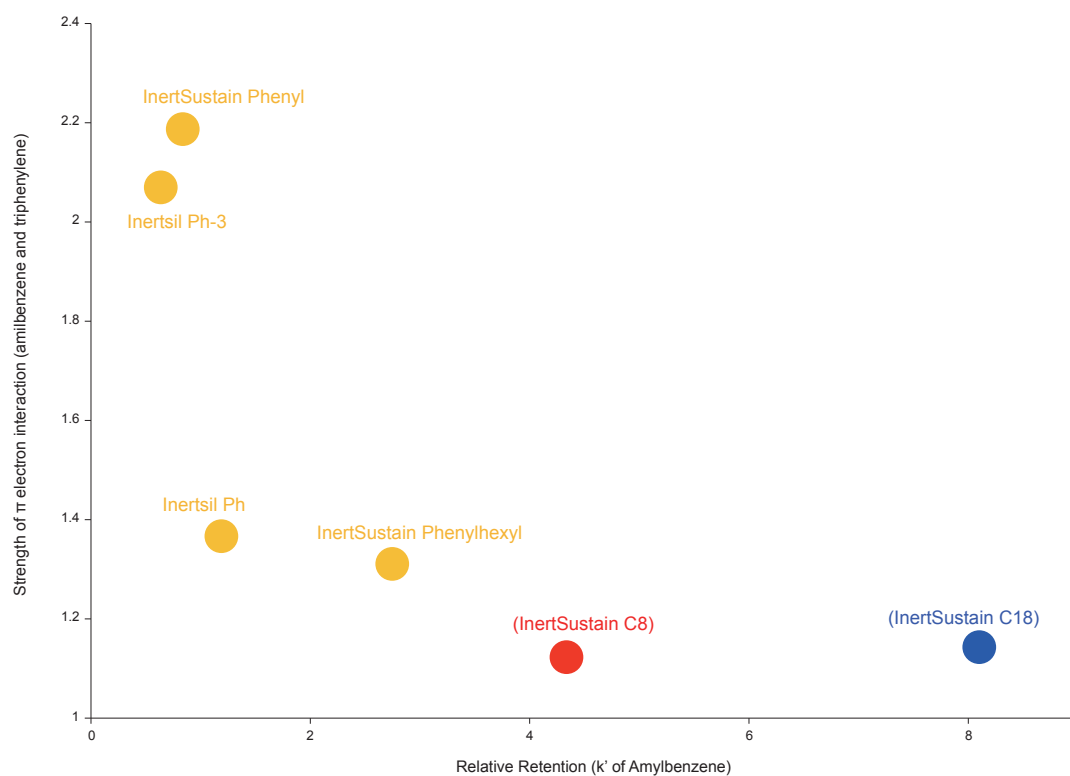
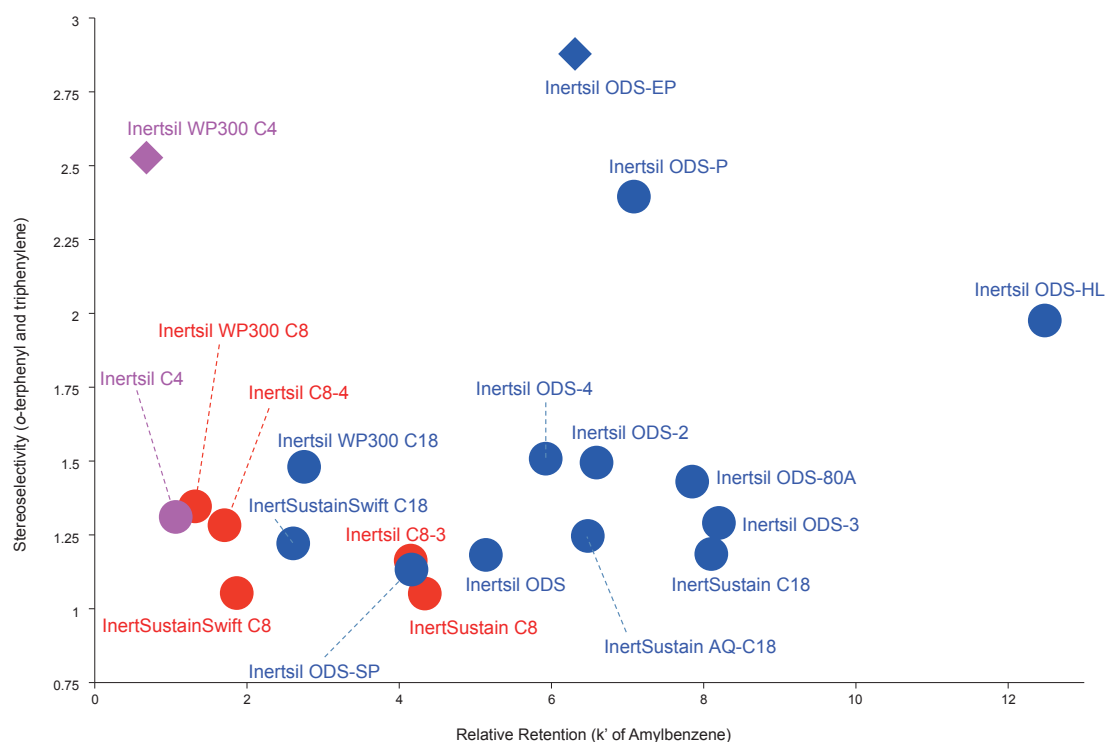


Reversed Phase Columns

The strengths of stereo selectivity and π - π interaction against retention strengths of reversed phase columns are shown below. The following contents are pointed in the chart.

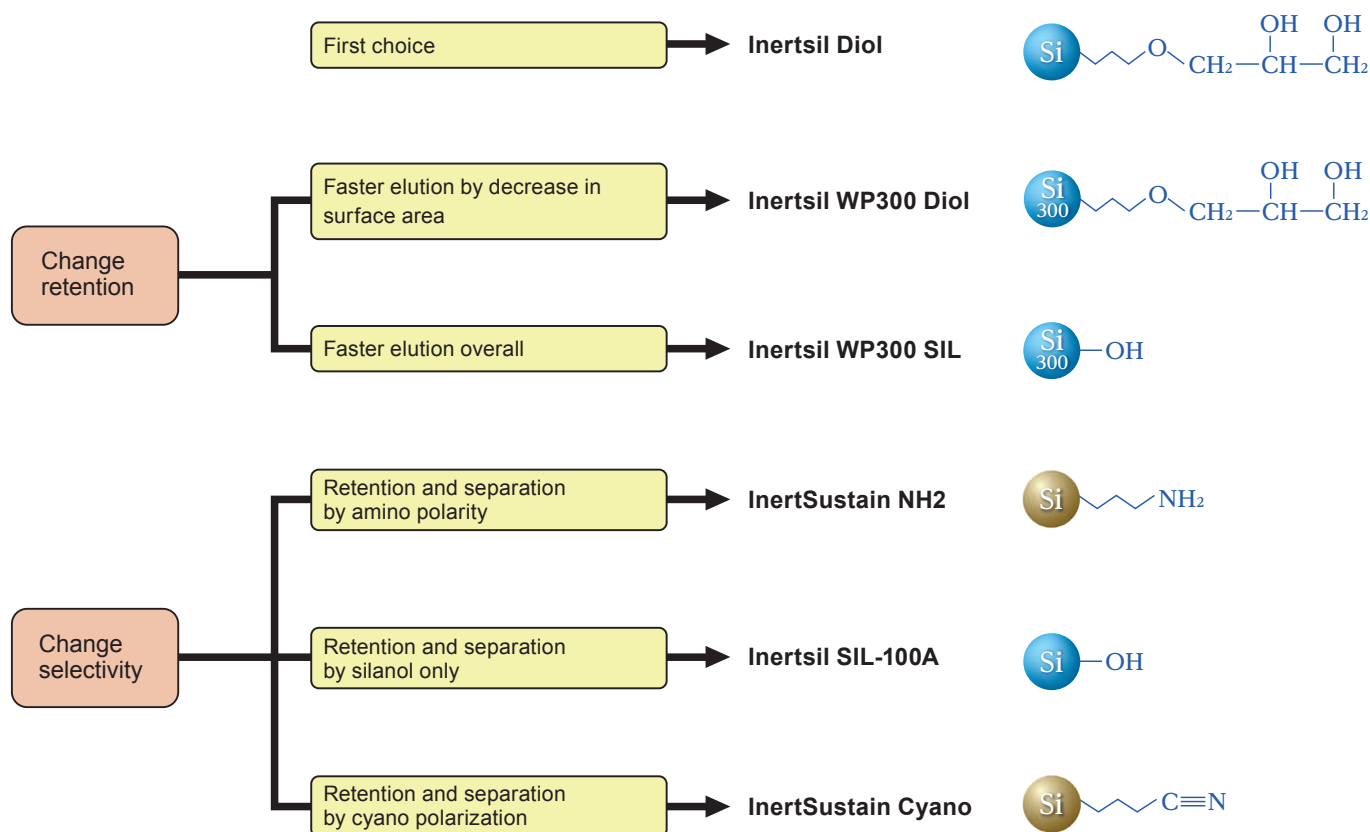
- Retentive factor of amyl benzene as retentivity.
- Relative retention of *o*-terphenyl and triphenylene as stereo selectivity.
- Relative retention value of amylbenzene and triphenylene as strength of π - π interaction.
- ♦ Type was plotted to discriminate from the other columns since polar group endohedral (embedded type) columns

InertSustain, Inertsil Distribution Model

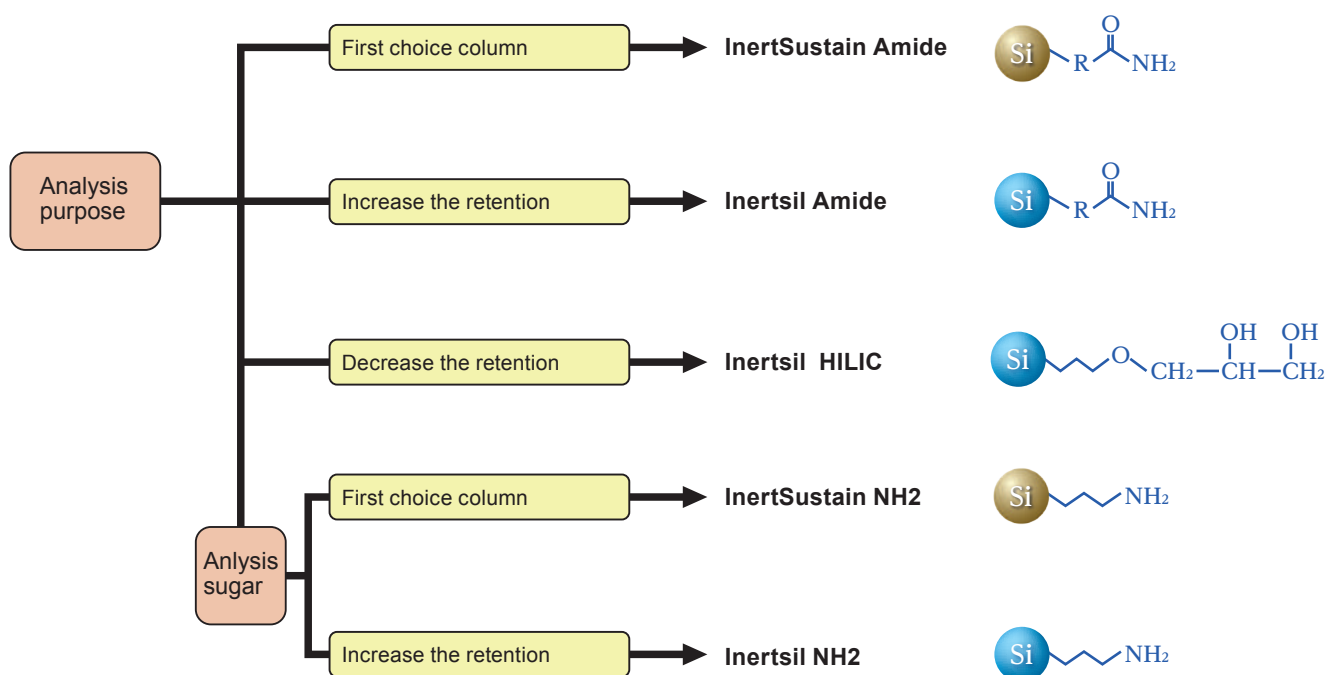


Normal Phase Column Selection Guide

Molecular Weight < 5,000 Samples on Normal Phase Mode



Selecting HILIC Mode Columns

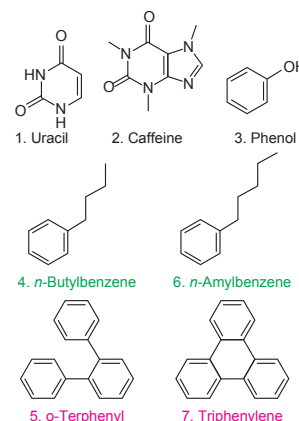


Selectivity Comparison of Reversed Phase Columns

Selectivity of reversed phase columns are compared under the same conditions, packing material size and column size. Chemical structural formulas used for the comparison are shown at right. Separation differences between basic compounds, acidic compounds, alkyl benzenes and polyaromatic compounds shows the differences of column selectivity. The more silanol groups on the packing material lead the later elution time of caffeine compared with that of phenol. The higher hydrophobicity of the column shows the later elution time of *n*-Amylbenzene compared with that of *n*-Butylbenzene. The higher steric selectivity of the column shows the later elution time of Triphenylene compared with that of *o*-Terphenyl.

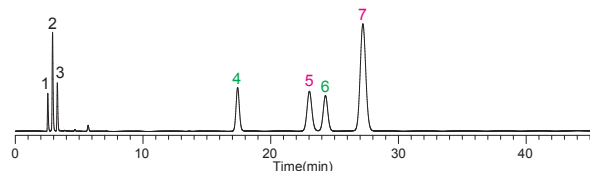
Conditions

Column : Reversed Phase Column
(5 μ m, 250 $\times$ 4.6 mm I.D.)^{*}
Eluent : A) CH₃OH
B) H₂O
: A/B = 80/20, v/v ,
(Inertsil Diol, CN-3)
A/B = 70/30, v/v ,
Flow Rate : 1.0 mL/min^{*}
Col. Temp. : 40 °C
Detection : UV 254 nm
Injection Vol. : 5 μ L^{*}

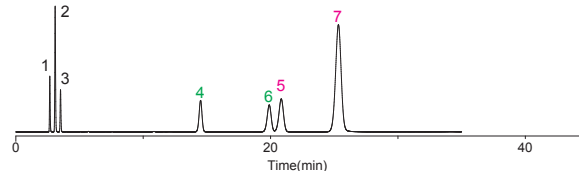


^{*} : For Mono Clad C18-HS (3.0 mm I.D.),
0.4 mL/min of flow rate and 2 μ L of injection
volume are adopted according to the
column internal diameter.

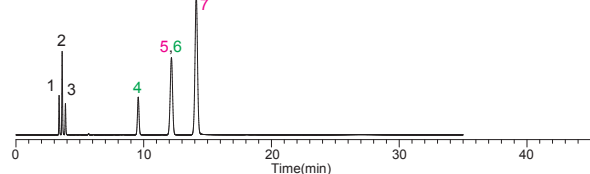
InertSustain C18



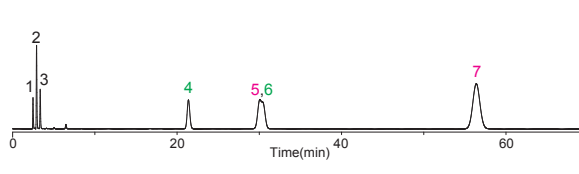
InertSustain AQ-C18



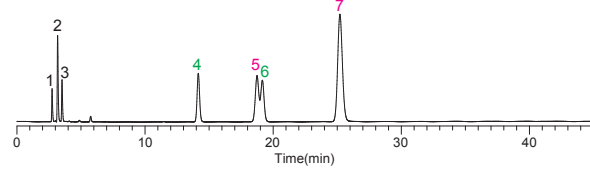
InertSustainSwift C18



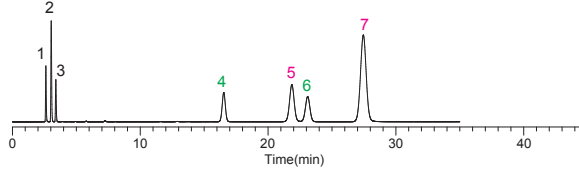
Inertsil ODS-HL



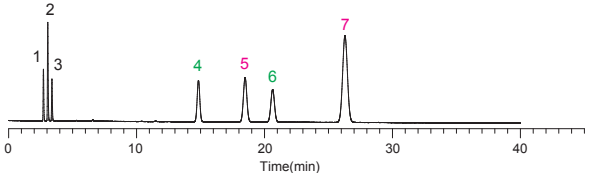
Inertsil ODS-4



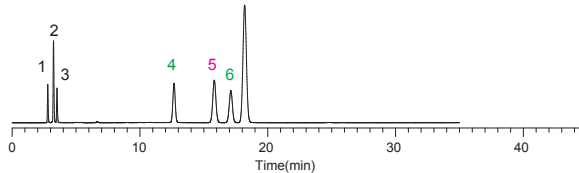
Inertsil ODS-3



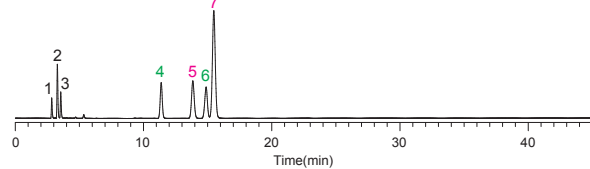
Inertsil ODS-2



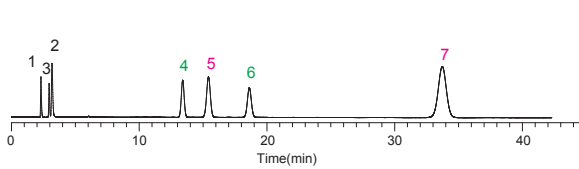
Inertsil ODS



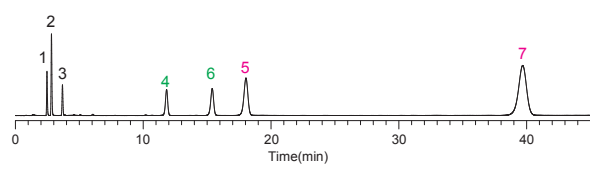
Inertsil ODS-SP



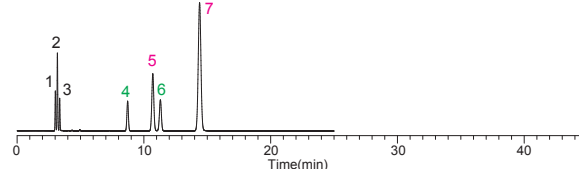
Inertsil ODS-P



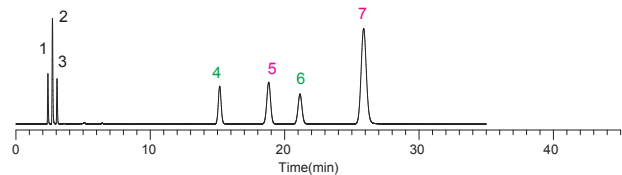
Inertsil ODS-EP



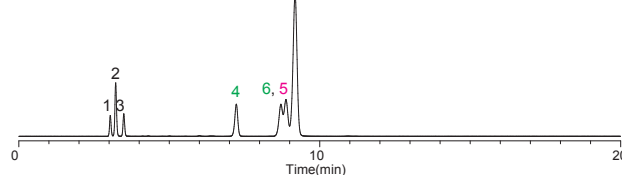
Inertsil WP300 C18



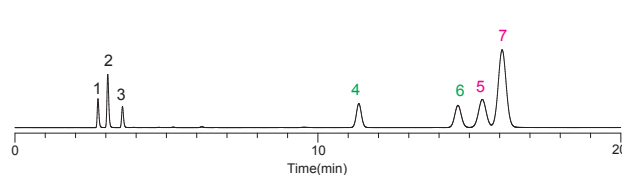
Inertsil ODS-80A



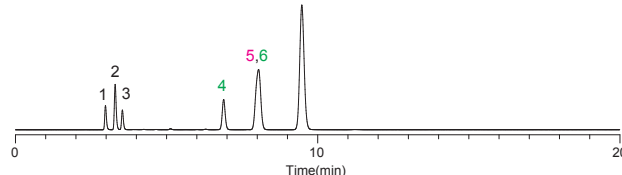
InertSustainSwift C8



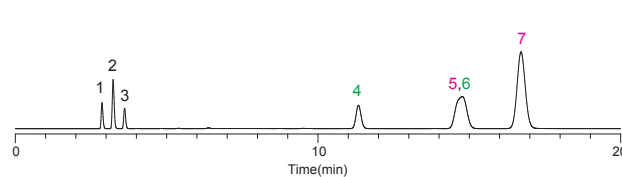
InertSustain C8



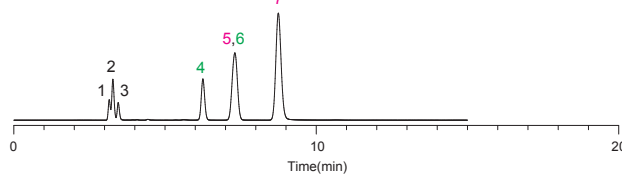
Inertsil C8-4



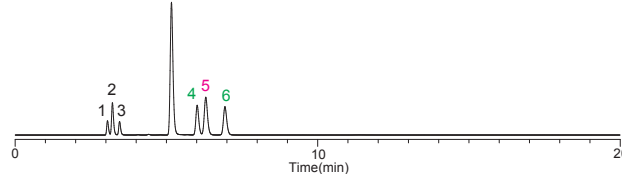
Inertsil C8-3



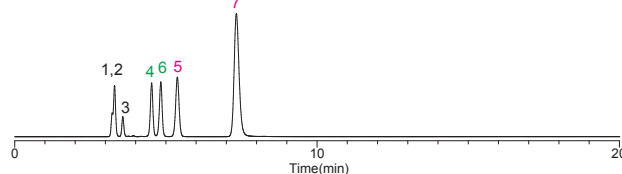
Inertsil WP300 C8



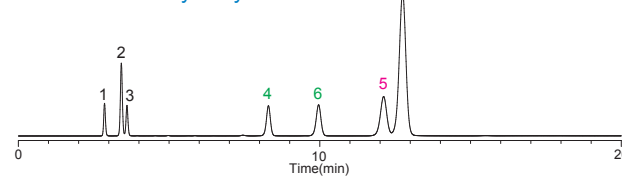
Inertsil C4



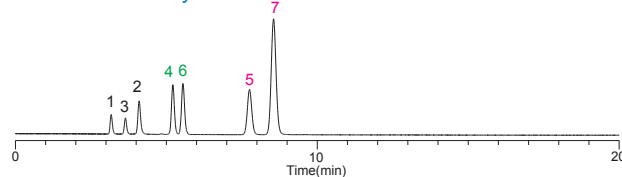
Inertsil WP300 C4



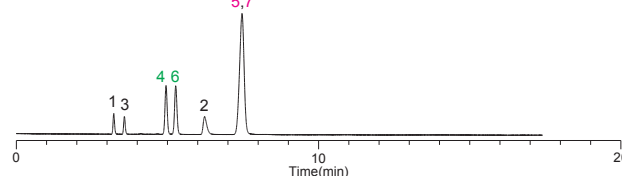
InertSustain Phenylhexyl



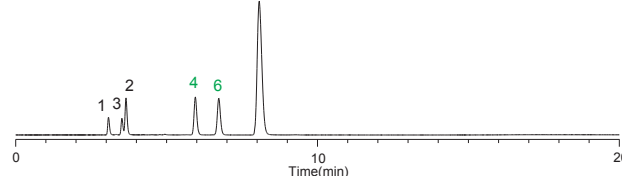
InertSustain Phenyl



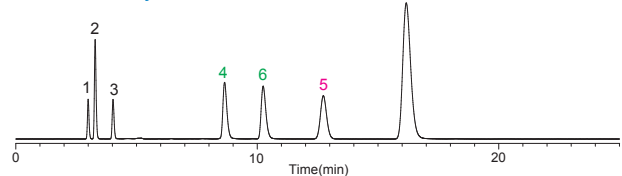
Inertsil Ph-3



Inertsil Ph



InertSustain Cyano



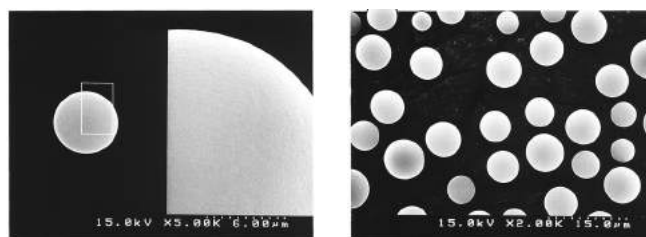
GL Sciences' State-of-the-art HPLC Technology

GL Sciences supports from the use of SPE to analysis. Among them all, HPLC columns which play a major role in separation analysis are manufactured by synthesizing base silica-gels, bonding phases and being packed into columns and through demanding tests for a stable supply with the same excellent quality all over the world. Based on accumulated know-how GL Sciences' manufacturing technology keeps on evolving to supply better columns for customers.

Sophisticated self-manufacturing technology for the base silica

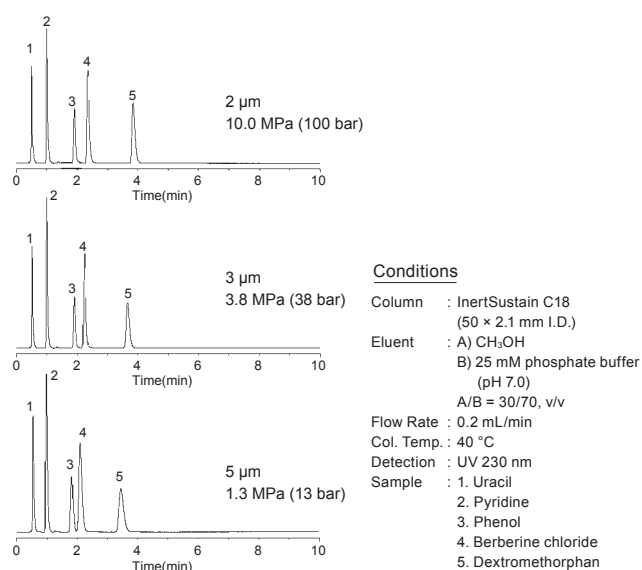
GL Sciences has been synthesizing base silica-gels, bonding phases and endcapping for column packing which enable us stable supply with exceptionally-high quality. Consequently those HPLC columns have been chosen for the method used for many years as reliable products.

Ultra pure base silica

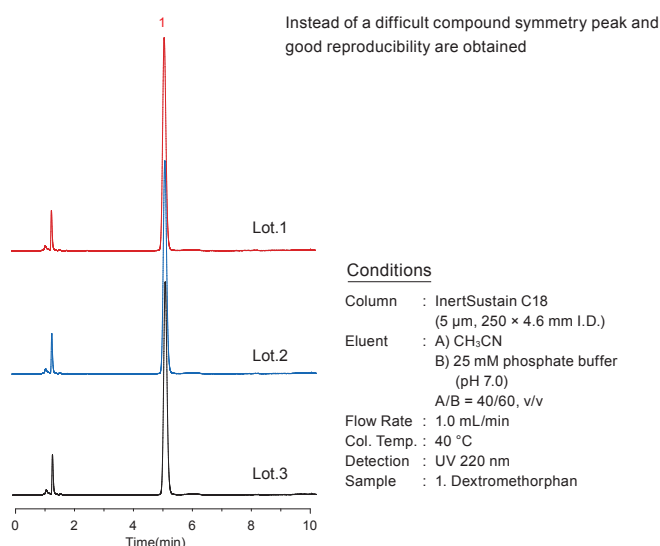


Reliable Column Performance

Provide the same Separation Patterns with the Changes of Particle Size

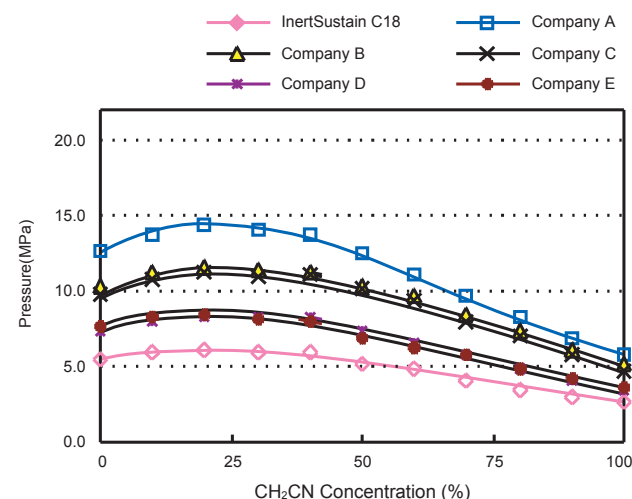


Strong Basic Compound Test

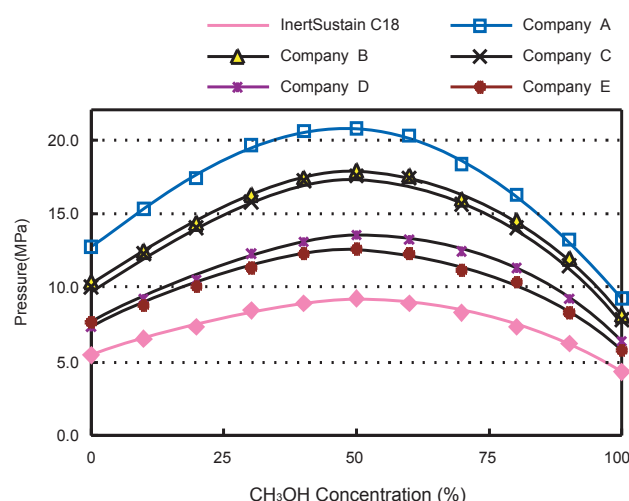


Base Silica is Designed for Low Column Back Pressure to Reduce the Load on the System

Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C

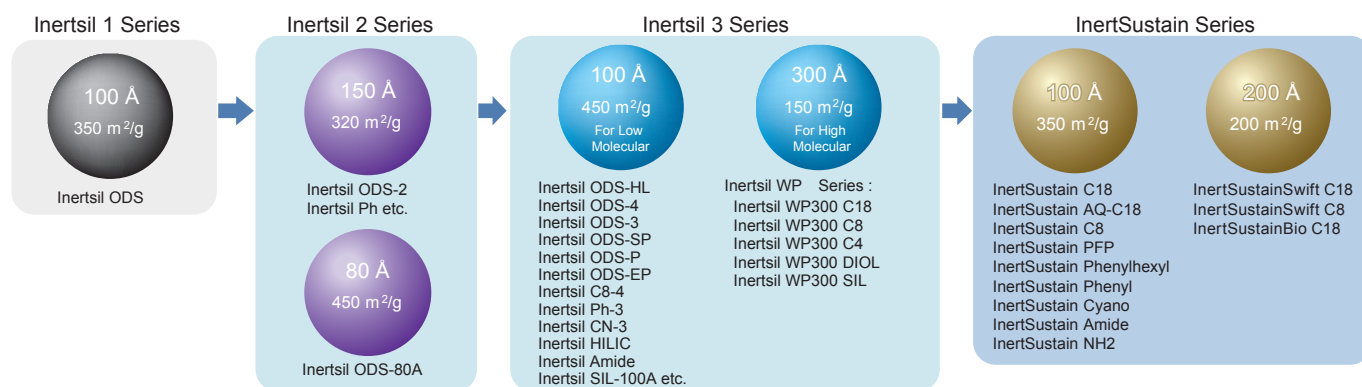


Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C



The Evolving HPLC Column Packings

GL Sciences has been steadily supplying with columns from Inertsil ODS, first-generation to InertSustain series, integration of state-of-the-art technologies, and has established a very good reputation around the world. They are available with the same quality and the same performance anywhere in the world.



Base on Evolutionally Surfaced Silica (ES Silica) evolved from Inertsil, InertSustain has developed

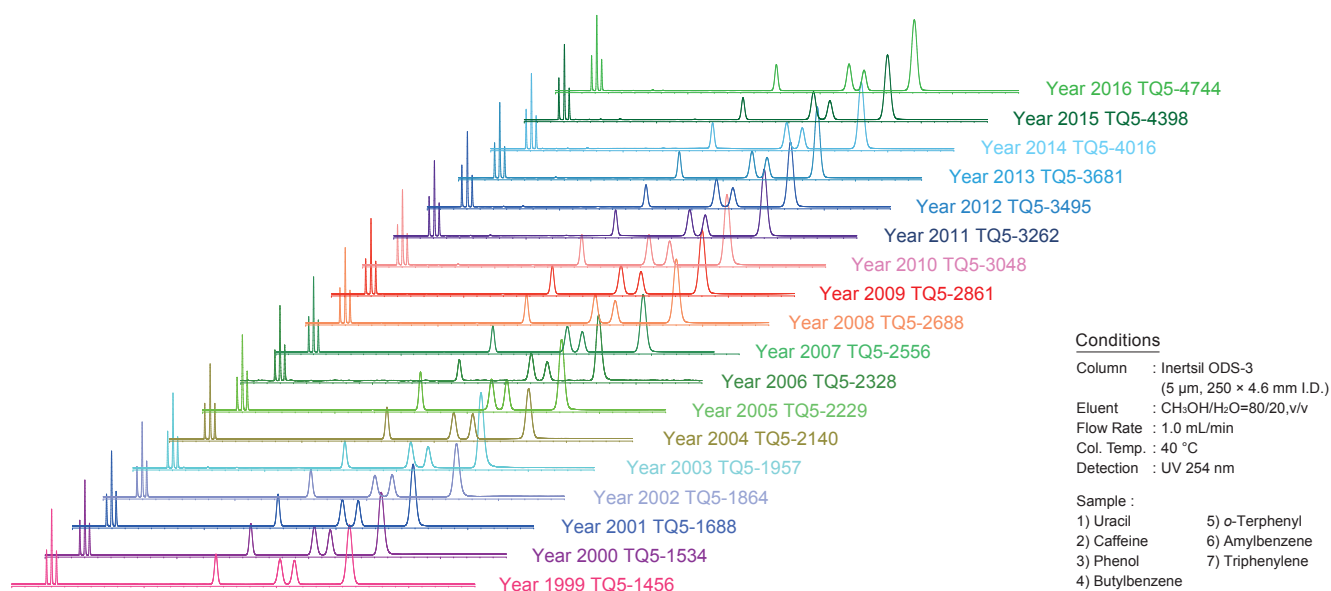
InertSustain employs a radically new type of silica, in which the surface of the silica is uniquely modified, the amount of silanols are controlled. Owing to this state-of-the-art technology ES silica allows easy surface modification including endcapping, which grants the following three favors.

1. Exceptionally improved inertness
2. Robust bonded phase
3. High reproducibility batch to batch

Owing to above benefits InertSustain is recommended as the first choice column for almost all compounds analyzed.

Batch to Batch Reproducibility

Keeping on stable supplies with high quality and performance, GL Sciences continues to evolve.



Quality Inspections

- ♦Sphericity and surface smoothness of Silica-gel with Scanning Electron Microscopy.
- ♦Particle size, Surface area, Pore diameter, Pore volume of Base Silica-Gel.
- ♦Trace metals impurity on Base Silica-Gel
- ♦Chemical bonding amount
- ♦Residual Silanol Groups by ^{29}Si -NMR
- ♦Chromatographic Test for each lot (4 Standard Samples)
- ♦Column Performance Tests for Individual Columns

ISO Certification



GL Sciences is ISO14001 Compliant Company

Product Ranges: Development, manufacture and sale of instruments, parts, accessories, columns, packing materials, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry



GL Sciences Fukushima Factory is ISO9001 Compliant Facility

Product Ranges: Design, manufacture and supply of instruments, parts, accessories, columns, packings, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry



General Technical Division



Fukushima Factory

Reversed Phase Columns

• InertSustain C18	002	• InertSustainSwift C8	030
• InertSustain AQ-C18	006	• Inertsil C8-4	032
• InertSustainSwift C18	008	• Inertsil C8-3	034
• Inertsil ODS-HL	010	• Inertsil C8	036
• Inertsil ODS-4	012	• Inertsil C4	037
• Inertsil ODS-3	014	• InertSustain PFP	038
• Inertsil ODS-4V	016	• InertSustain Phenylhexyl	040
• Inertsil ODS-3V	017	• InertSustain Phenyl	042
• Inertsil ODS-SP	018	• Inertsil Ph-3	044
• Inertsil ODS-P	020	• Inertsil Ph	046
• Inertsil ODS-EP	022	• InertSustain Cyano	048
• Inertsil ODS-80A	024	• Inertsil WP300 C18	050
• Inertsil ODS-2	026	• Inertsil WP300 C8	052
• Inertsil ODS	027	• Inertsil WP300 C4	053
• InertSustain C8	028		

InertSustain C18

- Silica : High Purity ES Silica Gel
- Particle Size : 2 μm , 3 μm , 5 μm
- Surface Area : 350 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 14 %
- USP Code : L1
- pH Range : 1 - 10



Generally, silica based columns are mechanically stable and provide high efficiencies, however, they cannot be used under alkaline conditions and their residual silanol groups tend to adsorb organic bases. InertSustain C18 employs a radically new type of silica, in which the surface of the silica is uniquely modified, enabling precise control of the silica properties.

InertSustain C18 inherits the advantages of all the current Inertsil HPLC columns (e.g., extremely low operating back pressure, superior inertness to typically any analytes, high efficiency and compatibility with a wide range of solvents), but now can be used for wide pH analysis with consistent performance from column to column and lot to lot.

Figure 1 : Basic Compounds

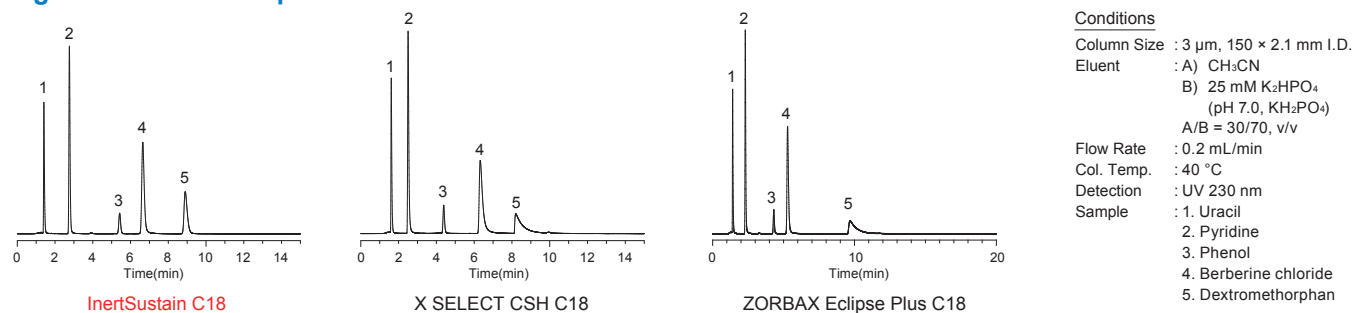


Figure 2 : Acidic Compounds

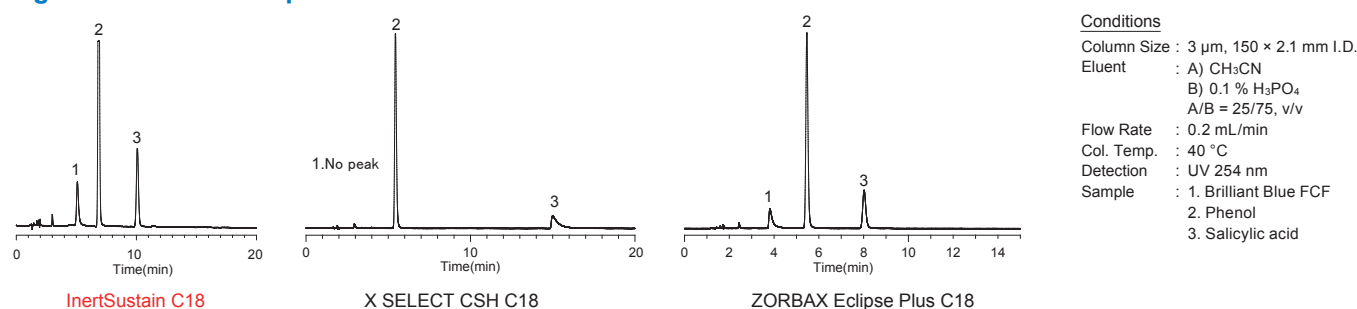
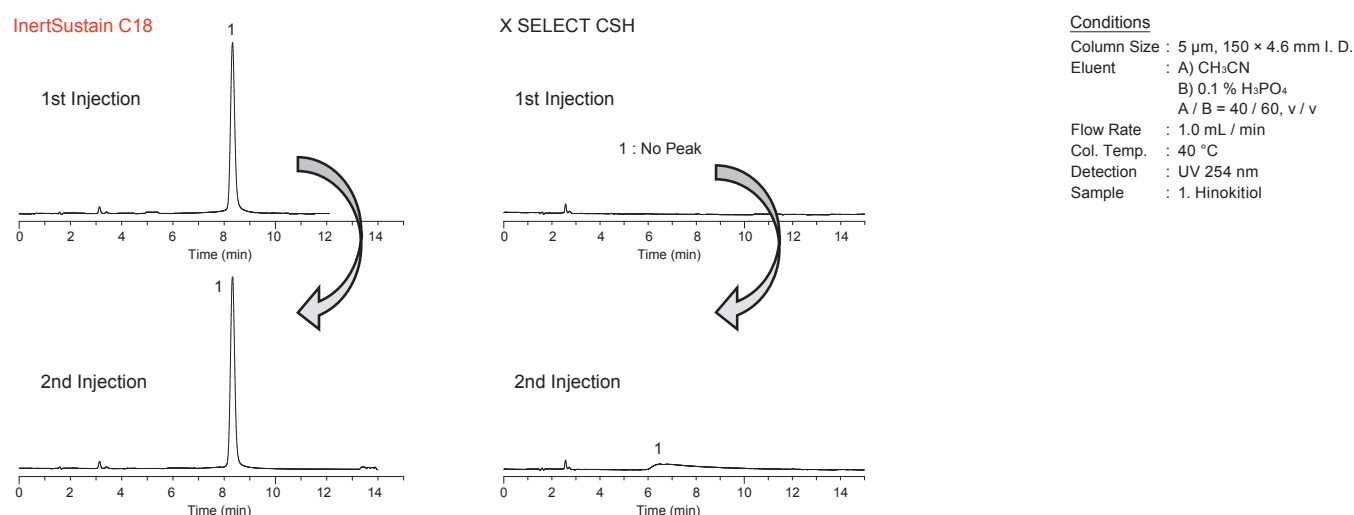
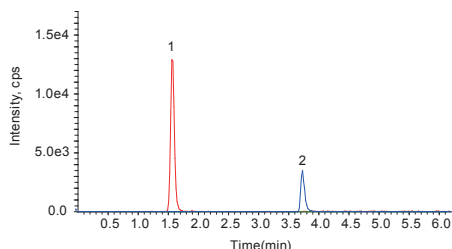
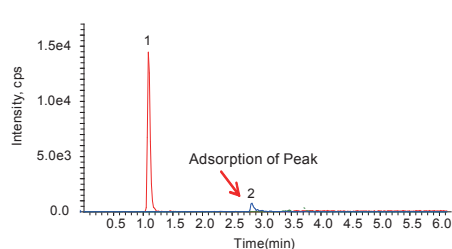


Figure 3 : Chelating Compounds



Comparison of Performance to Core-Shell Columns

As shown below, core-shell columns show peak tailing due to the presence of trace metals or silanol groups in their silica gel. Quantitative and qualitative analysis will be a source of concern since the adsorption of compounds can be expected.

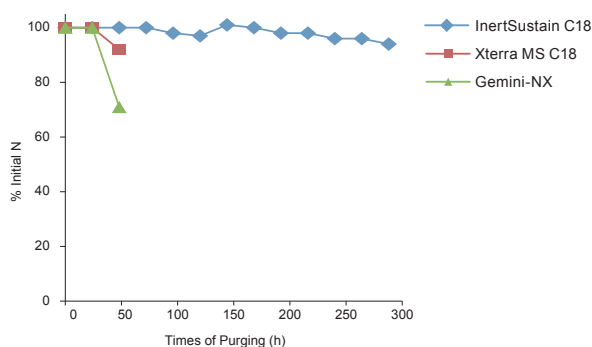
InertSustain C18 (3 μ m)Kinetex C18 (1.7 μ m)

Conditions

Column : ODS Column(100 × 2.1 mm I.D.)
 Eluent : A) 2 mM $\text{CH}_3\text{COONH}_4$ in 95 % CH_3CN
 B) 2 mM $\text{CH}_3\text{COONH}_4$ in 10 % CH_3CN
 A / B = 20 / 80 - 2 min - 100 / 0 - 2.5 min
 - 100 / 0 - 0.01 min - 20 / 80, v / v
 (Mixed by a gradient mixer)
 Flow Rate : 0.3 mL / min
 Col. Temp. : 40 °C
 Detection : LC / MS / MS
 (4000 QTRAP® : ESI, Positive, MRM)
 Injection Vol. : 10 μ L
 Sample : 1. Nitrofurazone (100 μ g / L)
 2. Lasalocid A (100 μ g / L)

Wide pH compatibility with Long Column Lifetime

As shown in the experiment below, due to the introduction of Evolved Surface Silica, InertSustain C18 maintained high efficiency and peak shape for 300 hours while other "wide pH" column brands failed.



Purging Conditions

Column Size : 5 μ m, 150 × 4.6 mm I.D.
 Eluent : A) CH_3OH
 B) 50 mM Triethylamine (pH 10.0)
 A/B = 30/70, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 50 °C

Analytical Conditions

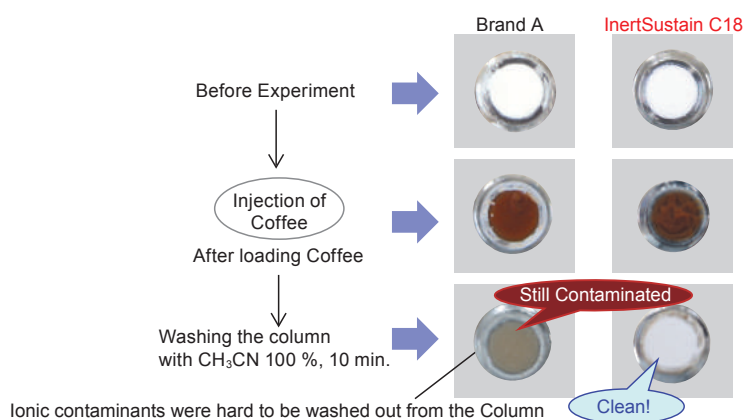
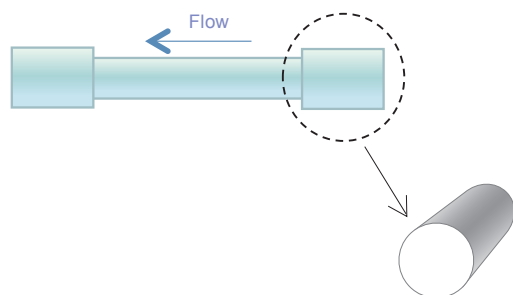
Eluent : A) CH_3CN
 B) H_2O
 A/B = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : Naphthalene

Experience the InertSustain! (Inertness and Sustainability)

Highly end-capped ODS column such as InertSustain C18 offers an opportunity to flush out contaminants from the column surface easily using an organic solvent. Coffee melanoidins are brown heterogeneous polymers contained in coffee. Its components are not clarified yet, but it is considered to contain several ionic compounds, which a poorly end-capped column will adsorb those ionic compounds leading to short column lifetime.

As for ODS column, which is commonly used for HPLC and LC/MS/MS, its inertness has an influence not only on peak shape but also detection sensitivity and durability. It is highly recommended to use highly end-capped column which provides good peak shape for both basic and acidic compounds such as InertSustain C18.

The packing material was visually confirmed by removing the column



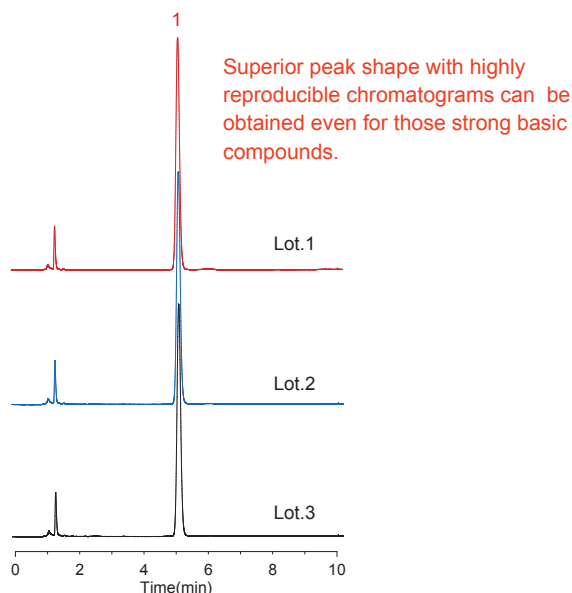
Ionic contaminants were hard to be washed out from the Column

InertSustain C18

Reliable Reproducibility, Performance and Quality

Rigorous quality control of physical properties and strict chromatographic tests for inertness and selectivity, contribute to the production of InertSustain C18 with an outstanding reproducibility and long column lifetime.

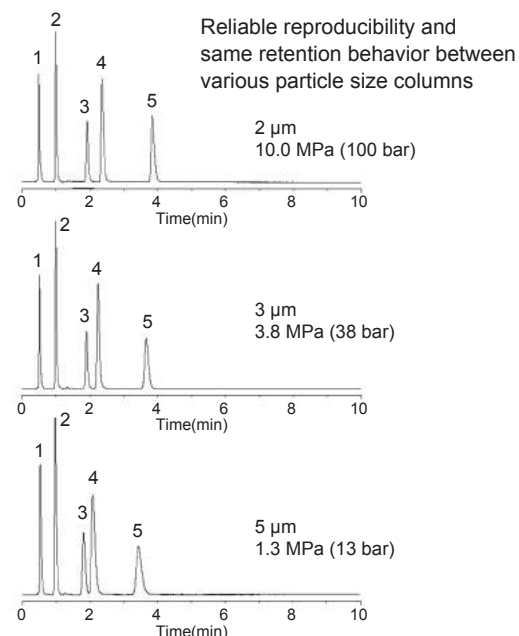
Figure 1 : Strong Basic Compound Test



Conditions

Column Size : 5 μ m, 250 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN
 B) 25 mM phosphate buffer (pH 7.0)
 A / B = 40 / 60, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 220 nm
 Sample : 1. Dextromethorphan

Same Retention Behavior between Various Particle Sizes



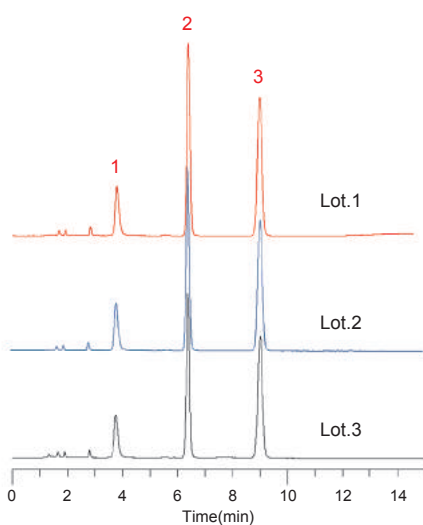
Conditions

Column Size : 50 $\times$ 2.1 mm I.D.
 Eluent : A) CH₃OH
 B) 25 mM phosphate buffer (pH 7.0)
 A / B = 30 / 70, v / v
 Flow Rate : 0.2 mL / min
 Col. Temp. : 40 °C
 Detection : UV 230 nm

Sample :

1. Uracil
2. Pyridine
3. Phenol
4. Berberine chloride
5. Dextromethorphan

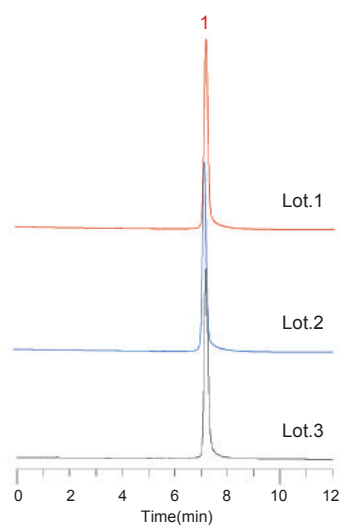
Figure 2 : Strong Acidic Compound Test



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN B) 0.1 % H₃PO₄
 A / B = 25 / 75, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : 1. Brilliant Blue FCF
 2. Phenol
 3. Salicylic acid

Figure 3 : Strong Chelating Compound Test



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN B) 0.1 % H₃PO₄
 A / B = 40 / 60, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : 1. Hinokitiol

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-14351	5020-14361		
	50	5020-14352	5020-14362		
	75	5020-14353	5020-14363		
	100	5020-14354	5020-14364		
	150	5020-14355	5020-14365		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-14411	5020-14421	5020-14441	
	50	5020-14412	5020-14422	5020-14442	
	75	5020-14413	5020-14423	5020-14443	
	100	5020-14414	5020-14424	5020-14444	
	150	5020-14415	5020-14425	5020-14445	
	250	5020-14416	5020-14426	5020-14446	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-14301	5020-14311		
	50	5020-14302	5020-14312		
	75	5020-14303	5020-14313		
	100	5020-14304	5020-14314		
	150	5020-14305	5020-14315		
	250	5020-14306	5020-14316		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-07411	5020-07421	5020-07431	5020-07441
	50	5020-07412	5020-07422	5020-07432	5020-07442
	75	5020-07413	5020-07423	5020-07433	5020-07443
	100	5020-07414	5020-07424	5020-07434	5020-07444
	125	5020-07417	5020-07427	5020-07437	5020-07447
	150	5020-07415	5020-07425	5020-07435	5020-07445
	250	5020-07416	5020-07426	5020-07436	5020-07446
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-14201	5020-14211		
	50	5020-14202	5020-14212		
	75	5020-14203	5020-14213		
	100	5020-14204	5020-14214		
	150	5020-14205	5020-14215		
	250	5020-14206	5020-14216		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-07311	5020-07321	5020-07331	5020-07341
	50	5020-07312	5020-07322	5020-07332	5020-07342
	75	5020-07313	5020-07323	5020-07333	5020-07343
	100	5020-07314	5020-07324	5020-07334	5020-07344
	125	5020-07317	5020-07327	5020-07337	5020-07348
	150	5020-07315	5020-07325	5020-07335	5020-07345
	250	5020-07316	5020-07326	5020-07336	5020-07346

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 μm	5 μm	3 μm	5 μm
1.0	10	1.0	5020-19250	5020-19249	5020-19300	5020-19299
1.5, 2.1		1.5	5020-19350	5020-19349	5020-19400	5020-19399
2.1, 3.0		3.0	5020-19150	5020-19149	5020-19200	5020-19199
4.0, 4.6		4.0	5020-19050	5020-19049	5020-19100	5020-19099
2.1, 3.0	20	3.0	5020-19550	5020-19549	5020-19600	5020-19599
4.0, 4.6		4.0	5020-19450	5020-19449	5020-19500	5020-19499
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

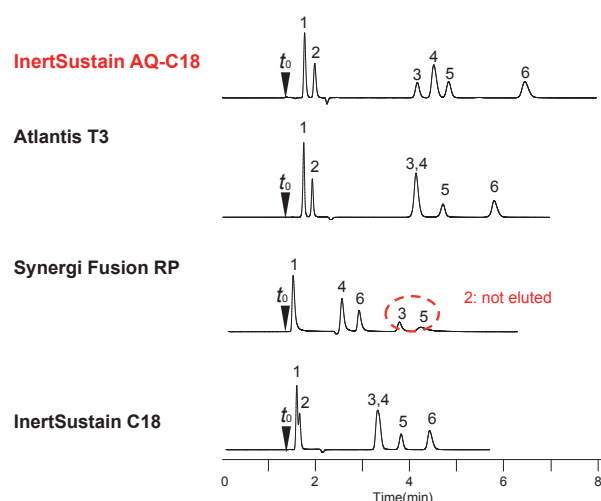
InertSustain AQ-C18

- Base Material : High Purity ES Silica Gel
- Particle Size : 1.9 μm , 3 μm , 5 μm
- Surface Area : 350 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 13%
- USP Code : L1, L96
- pH Range : 1 - 10



InertSustain AQ-C18 columns are designed to achieve strong retention for highly polar compounds, which is the most challenging goals in developing reversed phase methods. The optimization of bonding of the C18 groups at equal distance to the silica gel enable InertSustain AQ-C18 to offer significant retention for highly polar compounds even under water rich mobile phases.

Figure 1 : Superior Retention for Highly Polar Compound



Conditions

Column : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : 0.1 % HCOOH in H_2O
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 210 nm

Sample :

1. Pyridoxamine (Vitamin B6)
2. Thiamin (Vitamin B1)
3. Nicotinic acid (Vitamin B3)
4. Pyridoxal (Vitamin B6)
5. Nicotinamide (Vitamin B3)
6. Pyridoxine (Vitamin B6)

Figure 2: InertSustain AQ-C18 Provided Strong Retention for all Basic, Neutral and Acidic Compounds under 100% Water Mobile Phase

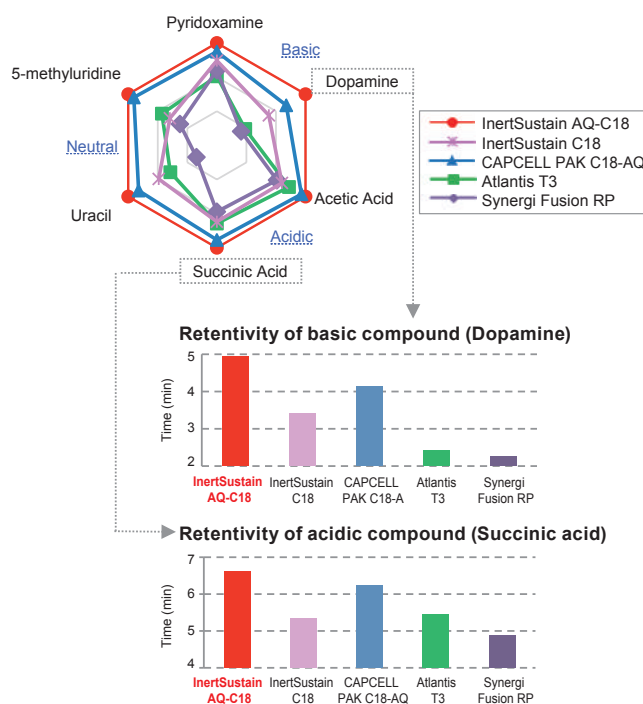
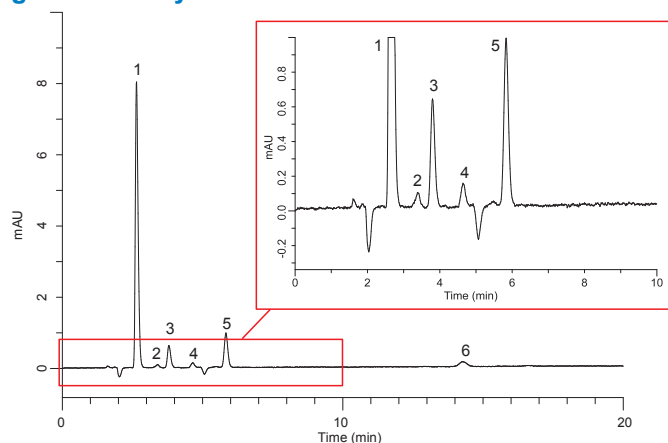


Figure 3 : Analysis of Nucleotide in Fish Meat



Conditions

Column : InertSustain AQ-C18
 (5 μm , 150 $\times$ 4.6 mm I.D.)
 Eluent : 50 mM K_2HPO_4 in H_2O (pH 7.0, H_3PO_4)*
 Flow Rate : 1.0 mL/min
 Col.Temp. : 40 $^\circ\text{C}$
 Detection : UV 260 nm
 Injection Vol. : 1 μL

Sample : 1. IMP
 2. ATP
 3. ADP
 4. AMP
 5. Hyp
 6. Ino
 (each 5 mg/L)

* ; Equilibrate the column $\text{CH}_3\text{CN}/\text{H}_2\text{O}=1/1, \text{v/v}$ after the analysis.
 When storing the column for a long period of time, store it with 100% CH_3CN 100%.

Analytical Columns

Particle Size: 1.9 µm	Length \ I.D. (mm)	2.1	3.0		
	50	5020-89938	5020-89941		
	100	5020-89939	5020-89942		
	150	5020-89940	5020-89943		
HP Series Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-89920	5020-89926	5020-89932	
	50	5020-89921	5020-89927	5020-89933	
	75	5020-89922	5020-89928	5020-89934	
	100	5020-89923	5020-89929	5020-89935	
	150	5020-89924	5020-89930	5020-89936	
	250	5020-89925	5020-89931	5020-89937	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89871	5020-89877		
	50	5020-89872	5020-89878		
	75	5020-89873	5020-89879		
	100	5020-89874	5020-89880		
	150	5020-89875	5020-89881		
	250	5020-89876	5020-89882		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89831	5020-89839	5020-89847	5020-89855
	50	5020-89832	5020-89840	5020-89848	5020-89856
	75	5020-89833	5020-89841	5020-89849	5020-89857
	100	5020-89834	5020-89842	5020-89850	5020-89858
	125	5020-89835	5020-89843	5020-89851	5020-89859
	150	5020-89836	5020-89844	5020-89852	5020-89860
	250	5020-89837	5020-89845	5020-89853	5020-89861
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89741	5020-89747		
	50	5020-89742	5020-89748		
	75	5020-89743	5020-89749		
	100	5020-89744	5020-89750		
	150	5020-89745	5020-89751		
	250	5020-89746	5020-89752		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89701	5020-89709	5020-89717	5020-89725
	50	5020-89702	5020-89710	5020-89718	5020-89726
	75	5020-89703	5020-89711	5020-89719	5020-89727
	100	5020-89704	5020-89712	5020-89720	5020-89728
	125	5020-89705	5020-89713	5020-89721	5020-89729
	150	5020-89706	5020-89714	5020-89722	5020-89730
	250	5020-89707	5020-89715	5020-89723	5020-89731

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 μm	5 μm	3 μm	5 μm
1.0	10	1.0	5020-89910	5020-89808	5020-89911	5020-89809
1.5, 2.1		1.5	5020-89912	5020-89810	5020-89913	5020-89811
2.1, 3.0		3.0	5020-89908	5020-89806	5020-89909	5020-89807
4.0, 4.6		4.0	5020-89906	5020-89804	5020-89907	5020-89805
2.1, 3.0	20	3.0	5020-89916	5020-89814	5020-89917	5020-89815
4.0, 4.6		4.0	5020-89914	5020-89812	5020-89915	5020-89813
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

InertSustainSwift C18

- Silica : High Purity ES Silica Gel
- Particle Size : 1.9 μm , 3 μm , 5 μm
- Surface Area : 200 m^2/g
- Pore Size : 200 Å (20 nm)
- Pore Volume : 1.00 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 9.0 %
- USP Code : L1
- pH Range : 1.0 - 10.0



As shown in Figure 1, InertSustainSwift C18 maintains the same extreme inertness, wide pH range and provide rapid separations with symmetric peaks. The optimization of surface area, pore size and chemical bonding delivers superior peak shapes (Figure 2). Figure 3 proves InertSustainSwift C18 is also ideal for LC/MS/MS applications which offer highly sensitive results and enables MS compatible buffers to be used due to the extremely inert silica gel.

Figure 1 : Comparison of Retentivity

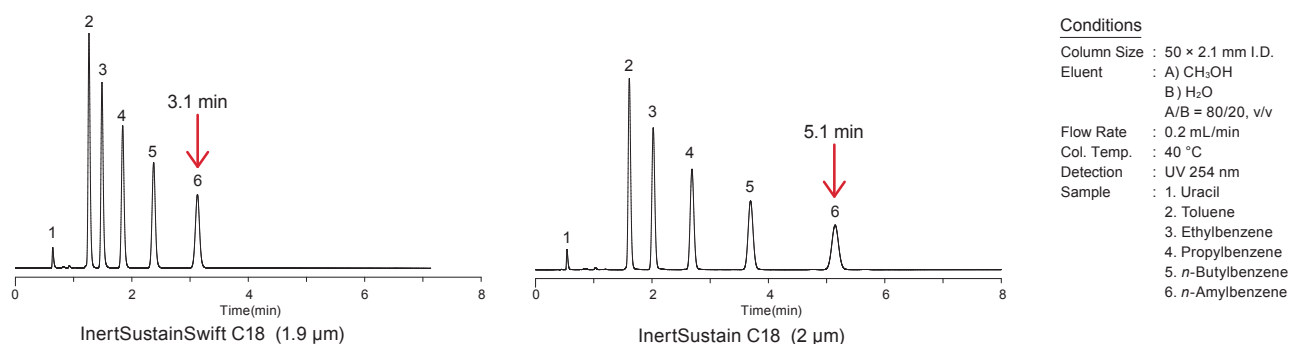


Figure 2 : Rapid LC/MS/MS Analysis of Basic Drugs

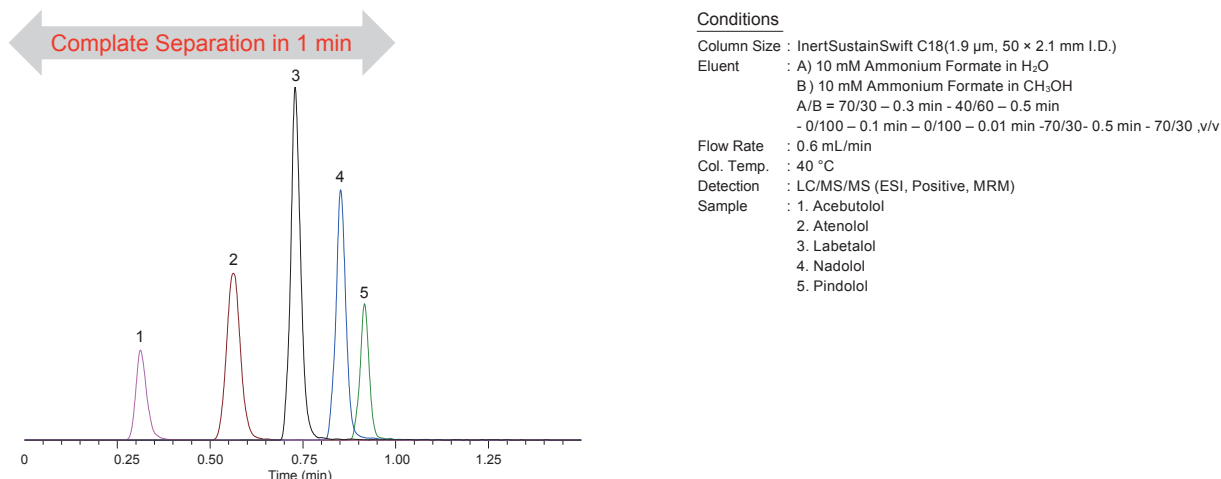
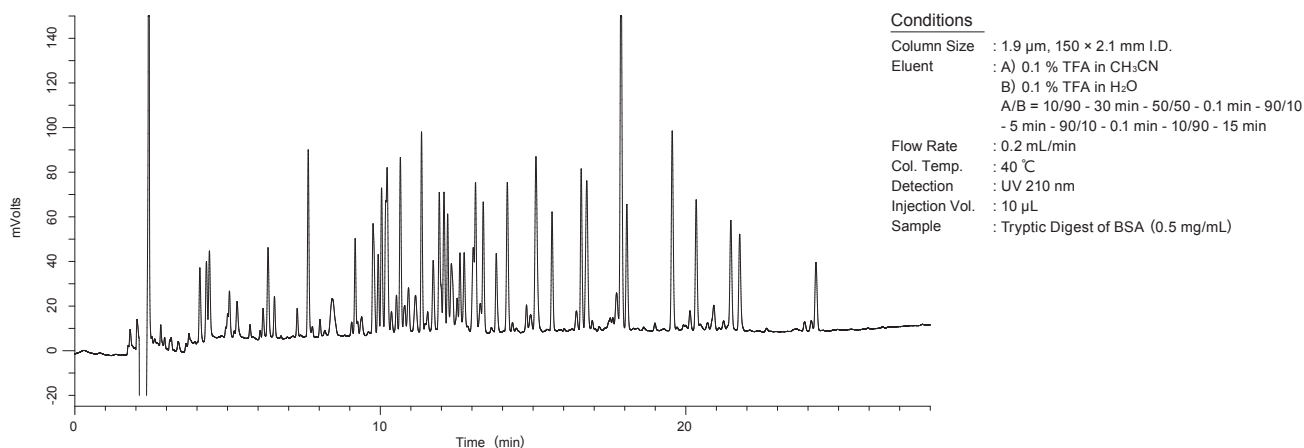


Figure 3 : Analysis of BSA Digests



Analytical Columns

Particle Size: 1.9 µm	Length \ I.D. (mm)	2.1	3.0		
	50	5020-88228	5020-88233		
	100	5020-88230	5020-88235		
	150	5020-88231	5020-88236		
HP Series Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	50	5020-88210	5020-88216	5020-88222	
	100	5020-88212	5020-88218	5020-88224	
	150	5020-88213	5020-88219	5020-88225	
	250	5020-88214	5020-88220	5020-88226	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88160	5020-88166		
	50	5020-88161	5020-88167		
	75	5020-88162	5020-88168		
	100	5020-88163	5020-88169		
	150	5020-88164	5020-88170		
	250	5020-88165	5020-88171		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88124	5020-88131	5020-88138	5020-88145
	50	5020-88125	5020-88132	5020-88139	5020-88146
	75	5020-88126	5020-88133	5020-88140	5020-88147
	100	5020-88127	5020-88134	5020-88141	5020-88148
	125	5020-88253	5020-88254	5020-88255	5020-88256
	150	5020-88128	5020-88135	5020-88142	5020-88149
	250	5020-88129	5020-88136	5020-88143	5020-88150
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88038	5020-88044		
	50	5020-88039	5020-88045		
	75	5020-88040	5020-88046		
	100	5020-88041	5020-88047		
	150	5020-88042	5020-88048		
	250	5020-88043	5020-88049		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88001	5020-88008	5020-88015	5020-88022
	50	5020-88002	5020-88009	5020-88016	5020-88023
	75	5020-88003	5020-88010	5020-88017	5020-88024
	100	5020-88004	5020-88011	5020-88018	5020-88025
	125	5020-88249	5020-88250	5020-88251	5020-88252
	150	5020-88005	5020-88012	5020-88019	5020-88026
	250	5020-88006	5020-88013	5020-88020	5020-88027

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-88199	5020-88105	5020-88200	5020-88106
1.5, 2.1		1.5	5020-88201	5020-88107	5020-88202	5020-88108
2.1, 3.0		3.0	5020-88197	5020-88103	5020-88198	5020-88104
4.0, 4.6		4.0	5020-88195	5020-88101	5020-88196	5020-88102
2.1, 3.0	20	3.0	5020-88205	5020-88111	5020-88206	5020-88112
4.0, 4.6		4.0	5020-88203	5020-88109	5020-88204	5020-88110
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

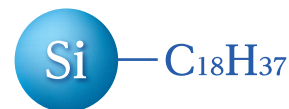
Capillary Columns

Applications

Cat. No. Index

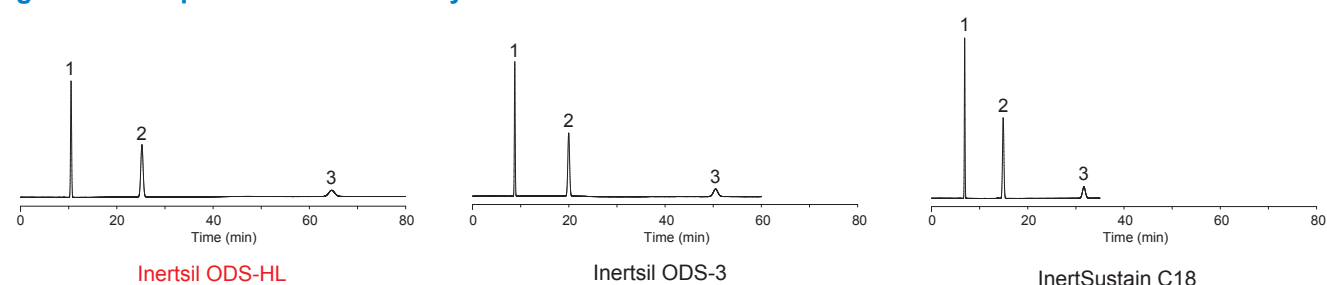
Inertsil ODS-HL

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm , 10 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 23%
- **USP Code** : L1
- **pH Range** : 2 - 7.5



Inertsil ODS-HL employs a highly inert packing material which provides pure hydrophobic interaction between analytes without generating any secondary interaction delivering sharp peaks.

Figure 1 : Comparison of Retentivity

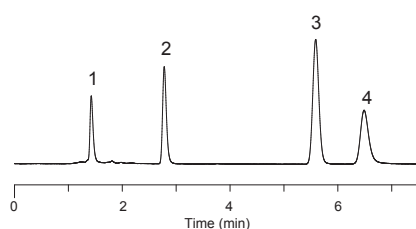


Conditions
 Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : CH_3CN
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 270 nm
 Injection Vol. : 5 μL

Sample : 1. Vitamin K2 (MK-4)
 2. Vitamin K1
 3. Vitamin K2 (MK-7) (50 mg/L each)

Figure 2 : Benefits of Highly Inert Packing Material

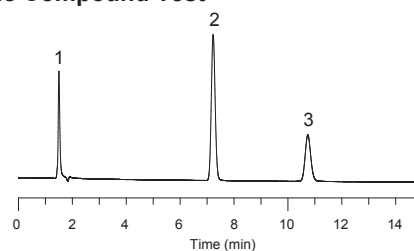
Basic Compound Test



Conditions
 Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN
 B) 25 mM K_2HPO_4 (pH 7.0)
 A/B = 30/70, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 230 nm

Sample : 1. Uracil
 2. Pyridine
 3. Phenol
 4. Berberine

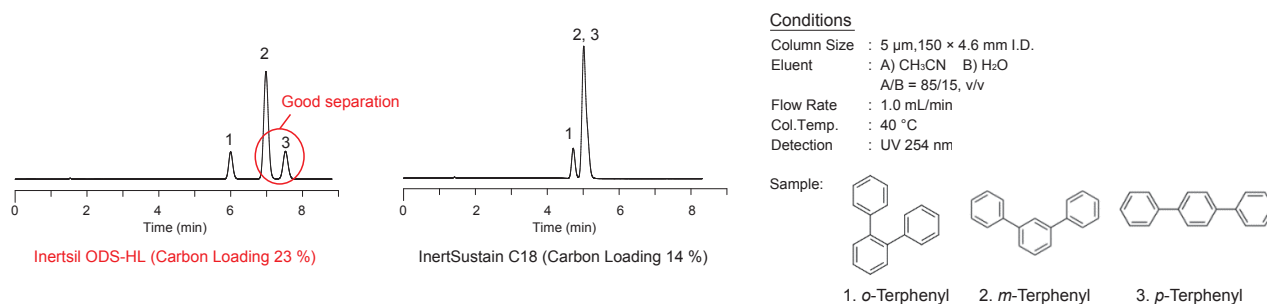
Acidic Compound Test



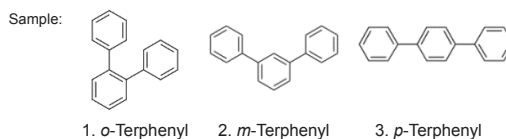
Conditions
 Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN B) H_2O
 B) 0.1 % H_3PO_4
 A/B = 25/75, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 230 nm

Sample : 1. Uracil
 2. Phenol
 3. Salicylic acid

Figure 3 : High - Density Bouding of C18 Phase Delivers Alternative Selectivity to Conventional C18 Columns



Conditions
 Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN B) H_2O
 A/B = 85/15, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm



Analytical Columns

HP Series Particle Size: 3 μm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-87315	5020-87321	5020-87327	
	50	5020-87316	5020-87322	5020-87328	
	75	5020-87317	5020-87323	5020-87329	
	100	5020-87318	5020-87324	5020-87330	
	150	5020-87319	5020-87325	5020-87331	
	250	5020-87320	5020-87326	5020-87332	
Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-87266	5020-87272		
	50	5020-87267	5020-87273		
	75	5020-87268	5020-87274		
	100	5020-87269	5020-87275		
	150	5020-87270	5020-87276		
	250	5020-87271	5020-87277		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87226	5020-87234	5020-87242	5020-87250
	50	5020-87227	5020-87235	5020-87243	5020-87251
	75	5020-87228	5020-87236	5020-87244	5020-87252
	100	5020-87229	5020-87237	5020-87245	5020-87253
	125	5020-87230	5020-87238	5020-87246	5020-87254
	150	5020-87231	5020-87239	5020-87247	5020-87255
	250	5020-87232	5020-87240	5020-87248	5020-87256
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-87142	5020-87148		
	50	5020-87143	5020-87149		
	75	5020-87144	5020-87150		
	100	5020-87145	5020-87151		
	150	5020-87146	5020-87152		
	250	5020-87147	5020-87153		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87102	5020-87110	5020-87118	5020-87126
	50	5020-87103	5020-87111	5020-87119	5020-87127
	75	5020-87104	5020-87112	5020-87120	5020-87128
	100	5020-87105	5020-87113	5020-87121	5020-87129
	125	5020-87106	5020-87114	5020-87122	5020-87130
	150	5020-87107	5020-87115	5020-87123	5020-87131
	250	5020-87108	5020-87116	5020-87124	5020-87132

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-87305	5020-87209	5020-87306	5020-87210
1.5, 2.1		1.5	5020-87307	5020-87211	5020-87308	5020-87212
2.1, 3.0		3.0	5020-87303	5020-87207	5020-87304	5020-87208
4.0, 4.6		4.0	5020-87301	5020-87205	5020-87302	5020-87206
2.1, 3.0	20	3.0	5020-87311	5020-87215	5020-87312	5020-87216
4.0, 4.6		4.0	5020-87309	5020-87213	5020-87310	5020-87214
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

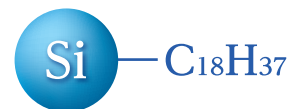
Capillary Columns

Applications

Cat. No. Index

Inertsil ODS-4

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 μm , 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 11 %
- USP Code : L1
- pH Range : 2 - 7.5



Inertsil ODS-4 delivers the same extreme inertness to any type of compounds just like InertSustain C18 along with unprecedented stability under 100 % aqueous mobile phases for qualitative and quantitative analysis.

However, as the base silica gel and carbon loading are different on Inertsil ODS-4, differences in selectivity can be observed for certain analytes.

Figure 1 : Comparison of Selectivity Between Various GL Sciences' Columns

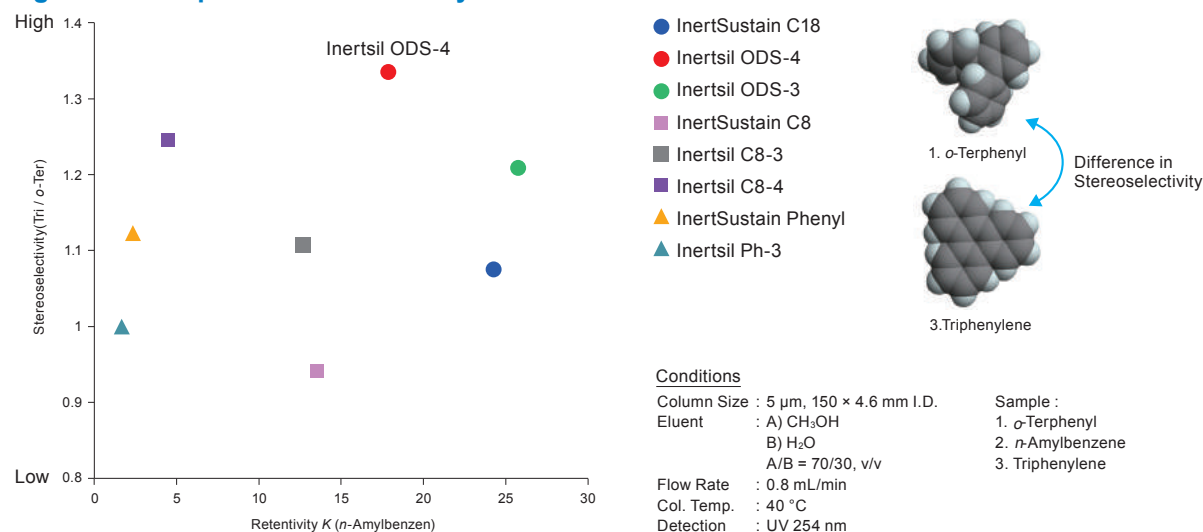
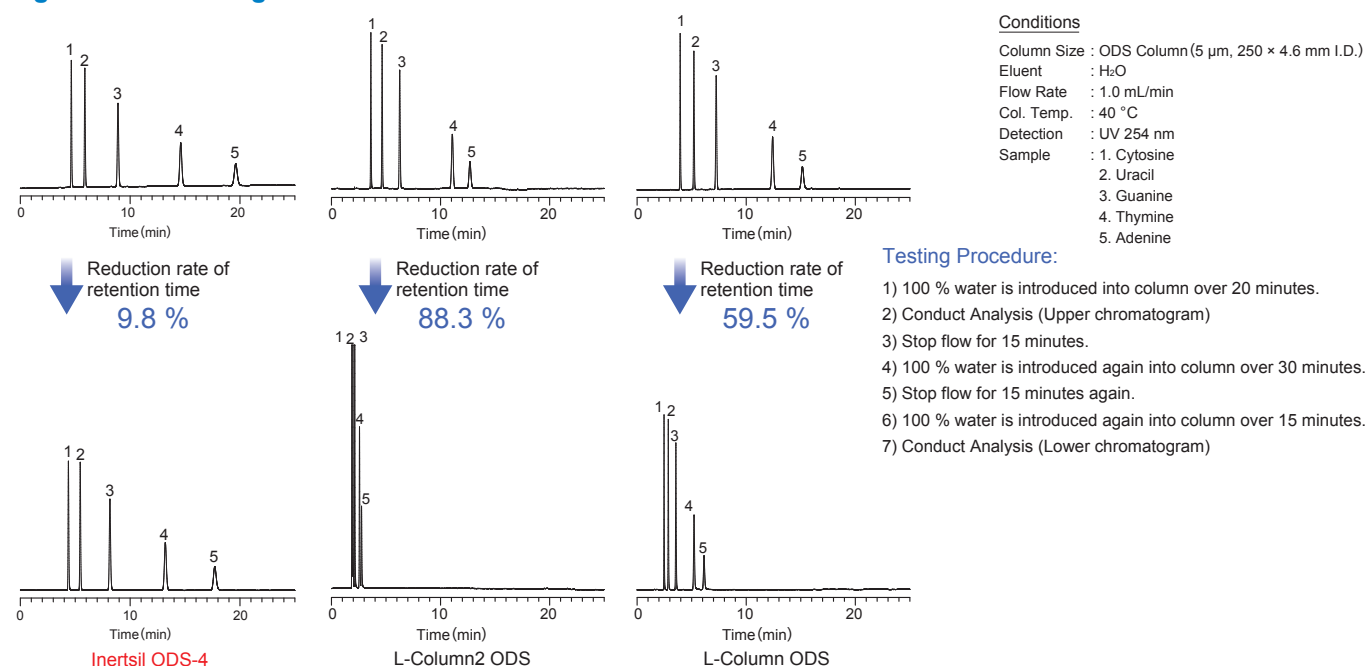


Figure 2 : Dewetting Test



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-81200	5020-81210		
	50	5020-81202	5020-81212		
	75	5020-81203	5020-81213		
	100	5020-81204	5020-81214		
	150	5020-81205	5020-81215		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-14061	5020-14064	5020-14067	
	50	5020-14062	5020-14065	5020-14068	
	75	5020-14063	5020-14066	5020-14069	
	100	5020-14001	5020-14004	5020-14007	
	150	5020-14002	5020-14005	5020-14008	
	250	5020-14003	5020-14006	5020-14009	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81111	5020-81121		
	50	5020-81112	5020-81122		
	75	5020-81113	5020-81123		
	100	5020-81114	5020-81124		
	150	5020-81115	5020-81125		
	250	5020-81116	5020-81126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-04011	5020-04021	5020-04031	5020-04041
	50	5020-04012	5020-04022	5020-04032	5020-04042
	75	5020-04013	5020-04023	5020-04033	5020-04043
	100	5020-04014	5020-04024	5020-04034	5020-04044
	125	5020-04017	5020-04027	5020-04037	5020-04047
	150	5020-04015	5020-04025	5020-04035	5020-04045
	250	5020-04016	5020-04026	5020-04036	5020-04046
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81011	5020-81021		
	50	5020-81012	5020-81022		
	75	5020-81013	5020-81023		
	100	5020-81014	5020-81024		
	150	5020-81015	5020-81025		
	250	5020-81016	5020-81026		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-03911	5020-03921	5020-03931	5020-03941
	50	5020-03912	5020-03922	5020-03932	5020-03942
	75	5020-03913	5020-03923	5020-03933	5020-03943
	100	5020-03914	5020-03924	5020-03934	5020-03944
	125	5020-03917	5020-03927	5020-03937	5020-03947
	150	5020-03915	5020-03925	5020-03935	5020-03945
	250	5020-03916	5020-03926	5020-03936	5020-03946

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19202	5020-19201	5020-19252	5020-19251
1.5, 2.1		1.5	5020-19302	5020-19301	5020-19352	5020-19351
2.1, 3.0		3.0	5020-19102	5020-19101	5020-19152	5020-19151
4.0, 4.6		4.0	5020-19002	5020-19001	5020-19052	5020-19051
2.1, 3.0	20	3.0	5020-19502	5020-19501	5020-19552	5020-19551
4.0, 4.6		4.0	5020-19402	5020-19401	5020-19452	5020-19451
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil ODS-3

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 4 µm, 5 µm, 10 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 15 %
- USP Code : L1
- pH Range : 2 - 7.5



Inertsil ODS-3 is still GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical, and contract research labs. As shown in Figure 1, Inertsil ODS-3 has a relatively strong retentivity compared to commercially available ODS columns. In addition, the introduction of higher surface area silica provide high preparative loading capacity without sacrificing peak shape which is illustrated in Figure 2.

Figure 1 : Comparison of Retentivity

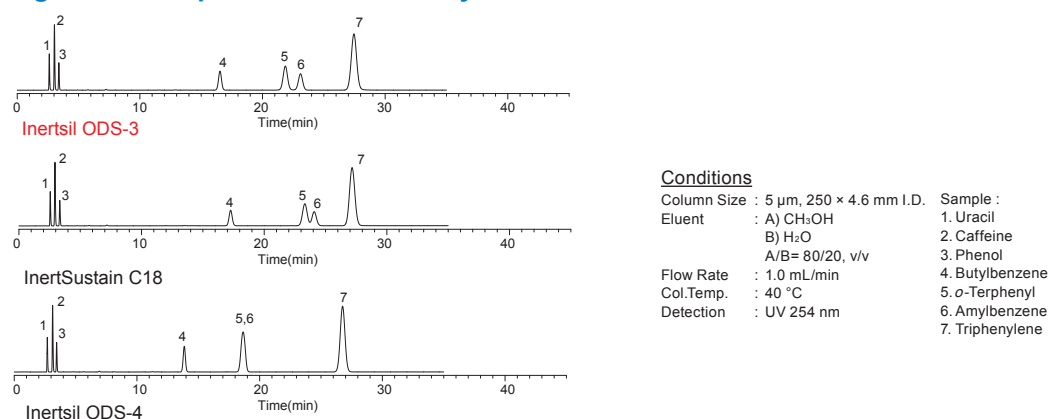
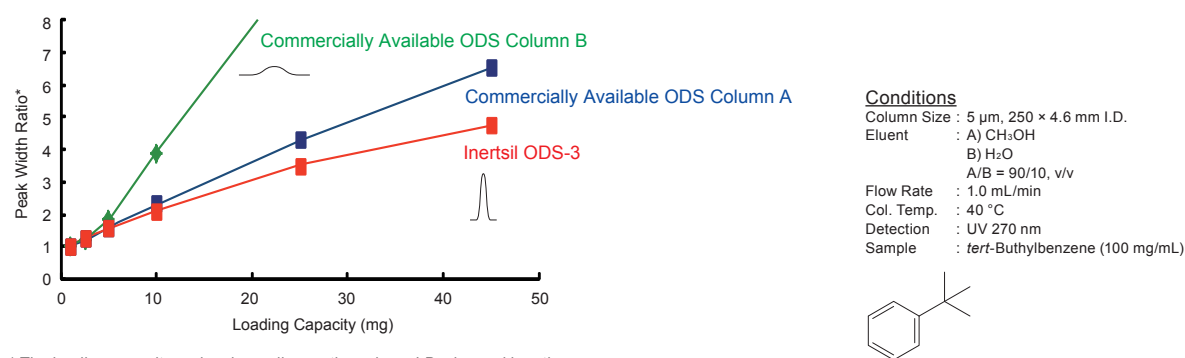


Figure 2 : Comparison of Loading Capacity



* The loading capacity varies depending on the column I.D. size and length.

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-84650	5020-84660	
	50	5020-84652	5020-84662	
	75	5020-84653	5020-84663	
	100	5020-84654	5020-84664	
	150	5020-84655	5020-84665	
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14081	5020-14084	5020-14087
	50	5020-14082	5020-14085	5020-14088
	75	5020-14083	5020-14086	5020-14089
	100	5020-14011	5020-14014	5020-14017
	150	5020-14012	5020-14015	5020-14018
	250	5020-14013	5020-14016	5020-14019

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84411	5020-84421		
	50	5020-84412	5020-84422		
	75	5020-84413	5020-84423		
	100	5020-84414	5020-84424		
	150	5020-13360	5020-13350		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04411	5020-04421	5020-04431	5020-04441
	50	5020-04412	5020-04422	5020-04432	5020-01774
	75	5020-04413	5020-04423	5020-04433	5020-01770
	100	5020-04414	5020-04424	5020-01790	5020-01775
	125	5020-04417	5020-04427	5020-01791	5020-01776
	150	5020-04415	5020-04425	5020-04435	5020-01771
	250	5020-04416	5020-04426	5020-04436	5020-01772
Particle Size: 4 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04611	5020-04621	5020-04631	5020-04641
	50	5020-04612	5020-04622	5020-04632	5020-04642
	75	5020-04613	5020-04623	5020-04633	5020-04643
	100	5020-04614	5020-04624	5020-04634	5020-04644
	125	5020-04617	5020-04627	5020-04637	5020-04647
	150	5020-04615	5020-04625	5020-04635	5020-04645
	250	5020-04616	5020-04626	5020-04636	5020-04646
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84511	5020-84521		
	50	5020-84512	5020-84522		
	75	5020-84513	5020-84523		
	100	5020-84514	5020-84524		
	150	5020-13251	5020-13241		
	250	5020-13252	5020-13242		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04511	5020-04521	5020-04531	5020-04541
	50	5020-04512	5020-04522	5020-04532	5020-01763
	75	5020-04513	5020-04523	5020-04533	5020-01764
	100	5020-04514	5020-04524	5020-01766	5020-01765
	125	5020-04515	5020-04525	5020-01767	5020-01768
	150	5020-01741	5020-01751	5020-01761	5020-01731
	250	5020-01742	5020-01752	5020-01762	5020-01732
Particle Size: 10 µm	Length \ I.D. (mm)	4.6			
	150	5020-01631			
	250	5020-01632			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)			
			Particle Size			Particle Size			
			3 µm	4 µm	5 µm	3 µm	4 µm	5 µm	
1.0	10	1.0	5020-19205	5020-19204	5020-19203	5020-19255	5020-19254	5020-19253	
1.5, 2.1		1.5	5020-19305	5020-19304	5020-19303	5020-19355	5020-19354	5020-19353	
2.1, 3.0		3.0	5020-19105	5020-19104	5020-19103	5020-19155	5020-19154	5020-19153	
4.0, 4.6		4.0	5020-19005	5020-19004	5020-19003	5020-19055	5020-19054	5020-19053	
2.1, 3.0	20	3.0	5020-19505	5020-19504	5020-19503	5020-19555	5020-19554	5020-19553	
4.0, 4.6		4.0	5020-19405	5020-19404	5020-19403	5020-19455	5020-19454	5020-19453	
Holder for Cartridge Guard Column E				For 10 mm Length					5020-08500
				For 20 mm Length					5020-08550

Inertsil ODS-4V

(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 11 %
- USP Code : L1
- pH Range : 2 - 7.5

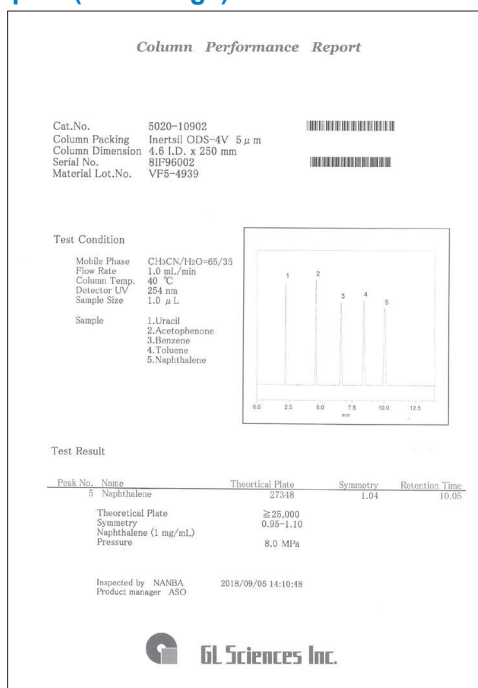


Inertsil ODS-4 columns have proven superior worldwide for analysis of strong pharmaceutical bases, acids, chelating compounds, and zwitterions. The long-awaited validated Inertsil ODS-4V has now been added to our product lineup.

Each Inertsil ODS-4V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing.

By choosing Inertsil ODS-4V, you can be assured that you are using one of the most trusted and enduring HPLC columns for validation.

Details of Column Performance Report (Front Page)



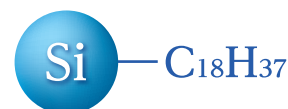
Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30212	5020-30222	5020-30232	5020-30242
	75	5020-30213	5020-30223	5020-30233	5020-30243
	100	5020-30214	5020-30224	5020-30234	5020-30244
	150	5020-30215	5020-30225	5020-30235	5020-30245
	250	5020-30216	5020-30226	5020-30236	5020-30246
Particle Size: 5 µm	Length \ I.D. (mm)	3.0	4.0	4.6	
	150	5020-10921	5020-10911	5020-10901	
	250	5020-10922	5020-10912	5020-10902	

Inertsil ODS-3V

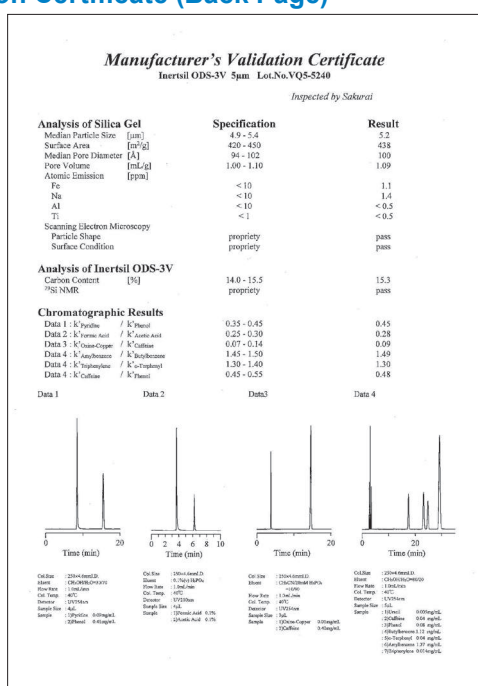
(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 15 %
- USP Code : L1
- pH Range : 2 - 7.5



Inertsil ODS-3V offers all of the outstanding chromatographic benefits of Inertsil ODS-3 with the added benefit of a more thoroughly documented, validated QC procedure consistent with the demands of GLP/GMP compliance. Each Inertsil ODS-3V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing. The use of Inertsil ODS-3V columns provides an extra measure of assurance of consistent performance from column to column and batch to batch. Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies.

Details of Manufacturer's Validation Certificate (Back Page)



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30112	5020-30122	5020-30132	5020-30142
	75	5020-30113	5020-30123	5020-30133	5020-30143
	100	5020-30114	5020-30124	5020-30134	5020-30144
	150	5020-30115	5020-30125	5020-30135	5020-30145
	250	5020-30116	5020-30126	5020-30136	5020-30146
Particle Size: 5 µm	Length \ I.D. (mm)	3.0	4.0	4.6	
	150	5020-01821	5020-01811	5020-01801	
	250	5020-01822	5020-01812	5020-01802	

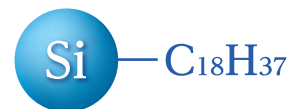
Validation Packs (3-Column-Sets)

Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies. Choose the column dimension and one of the following batch requirements. All three columns with single batch 2. Two columns with single batch and other a different batch 3. All three columns with different batches.

	Length \ I.D. (mm)	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-	5020-	5020-
	250	5020-	5020-	5020-

Inertsil ODS-SP

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 8.5 %
- USP Code : L1
- pH Range : 2 - 7.5



As shown in Figure 1, Inertsil ODS-SP is super base deactivated and optimally bonded to retain hydrophilic compounds without excessive retention of hydrophobic compounds achieving better separations faster than before.

As the carbon load of Inertsil ODS-SP is relatively low, it is compatible with 100 % aqueous eluents and offer faster equilibration of column for gradient analysis.

Figure 1 : Comparison of Retention Behavior between Inertsil ODS-3 and Inertsil ODS-SP

Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.

Eluent : A) CH_3OH
B) 10 mM NaH_2PO_4
A/B = 10/90 – 30 min – 50/50, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 $^\circ\text{C}$

Detection : UV 280 nm

Sample : 1. Galliccatechin (GC)

2. Epigallocatechin (EGC)

3. Catechin (C)

4. Epigallocatechin gallate (EGCg)

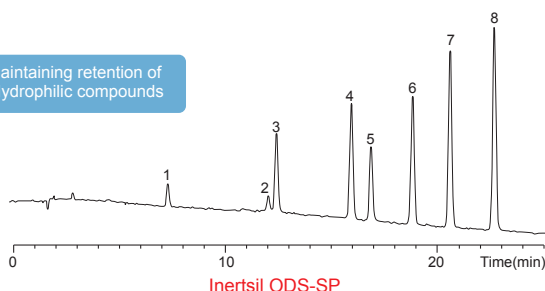
5. Epicatechin (EC)

6. Galliccatechin gallate (GCg)

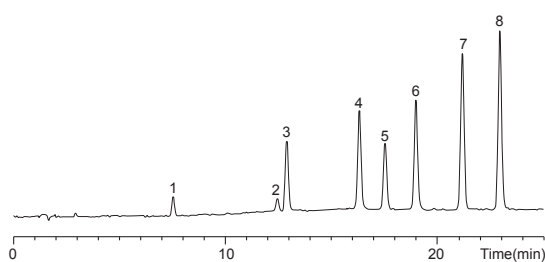
7. Epicatechin gallate (ECg)

8. Catechin gallate (Cg)

Maintaining retention of
Hydrophilic compounds



Inertsil ODS-SP



Inertsil ODS-3

Conditions

Column Size : 5 μm , 250 $\times$ 4.6 mm I.D.

Eluent : A) CH_3CN
B) 20 mM KH_2PO_4 (pH 3.0, H_3PO_4)
A/B = 70/30, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 $^\circ\text{C}$

Detection : UV 280 nm

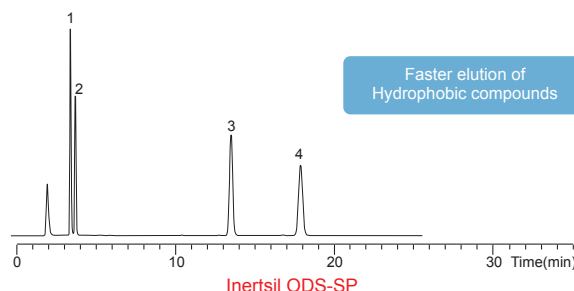
Sample : 1. Phenol

2. Bisphenol A

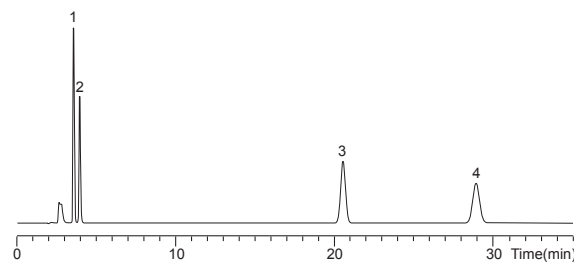
3. 4-Octylphenol

4. 4-Nonylphenol

Faster elution of
Hydrophobic compounds

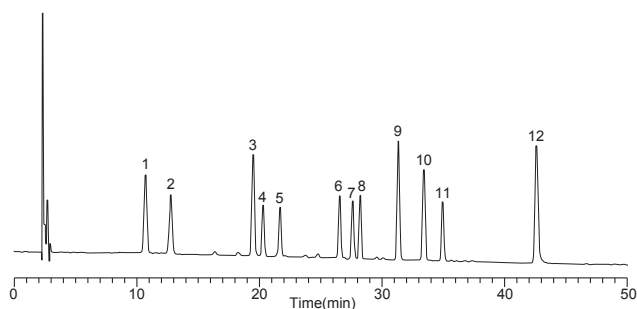


Inertsil ODS-SP



Inertsil ODS-3

Figure 2 : Simultaneous Analysis of Soybean Isoflavone



Conditions

Column : Inertsil ODS-SP
(5 μm , 250 $\times$ 4.6 mm I.D.)

Eluent : A) 0.1 % CH_3COOH in CH_3CN

B) 0.1 % CH_3COOH in H_2O

A/B = 15/85 – 8 min – 15/85 – 42 min – 35/65 – 10 min hold, v/v

Flow Rate : 1.5 mL/min

Col. Temp. : 35 $^\circ\text{C}$

Detection : UV 254 nm

Sample : 1. Daidzin (D)

2. Glycitin (Gly)

3. Genistin (Gl)

4. 6''-o-malonyldaidzin (MD)

5. 6''-o-malonylglycitin (MGI)

6. 6''-o-acetyldaidzin (AD)

7. 6''-o-acetylglycitin (AGI)

8. 6''-o-malonylgenistin (MG)

9. Daizein (De)

10. Glycitein (Gle)

11. 6''-o-acetylgenistin (AG)

12. Genistein (Ge)

Analytical Columns

HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14091	5020-14094	5020-14097
	50	5020-14092	5020-14095	5020-14098
	75	5020-14093	5020-14096	5020-14099
	100	5020-14021	5020-14024	5020-14027
	150	5020-14022	5020-14025	5020-14028
	250	5020-14023	5020-14026	5020-14029

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	20	5020-02811	5020-02821	5020-02831	5020-02841
	50	5020-02812	5020-02822	5020-02832	5020-02842
	75	5020-02813	5020-02823	5020-02833	5020-02843
	100	5020-02814	5020-02824	5020-02834	5020-02844
	150	5020-02815	5020-02825	5020-02835	5020-02845
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	20	5020-02711	5020-02721	5020-02731	5020-02741
	50	5020-02712	5020-02722	5020-02732	5020-02742
	75	5020-02713	5020-02723	5020-02733	5020-02743
	100	5020-02714	5020-02724	5020-02734	5020-02744
	150	5020-02715	5020-02725	5020-02735	5020-02745
	250	5020-02716	5020-02726	5020-02736	5020-02746

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19207	5020-19206	5020-19257	5020-19256
1.5, 2.1		1.5	5020-19307	5020-19306	5020-19357	5020-19356
2.1, 3.0		3.0	5020-19107	5020-19106	5020-19157	5020-19156
4.0, 4.6		4.0	5020-19007	5020-19006	5020-19057	5020-19056
2.1, 3.0	20	3.0	5020-19507	5020-19506	5020-19557	5020-19556
4.0, 4.6		4.0	5020-19407	5020-19406	5020-19457	5020-19456
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

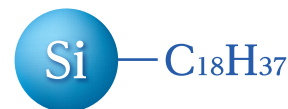
Capillary Columns

Applications

Cat. No. Index

Inertsil ODS-P

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : None
- Carbon Loading : 29 %
- USP Code : L1
- pH Range : 2 - 7.5



GL Sciences offers a polymerically bonded ODS-P phase which provide high steric selectivity for separation of planar and non-planar compounds as shown in Figure 1. This polymeric type C18 column delivers complete baseline separation of structurally similar compounds such as vitamins D2 and D3 which is illustrated in Figure 2. Inertsil ODS-P columns are also ideal for the HPLC analysis of 16 PAH compounds, listed as target pollutants by the US EPA.

Figure 1 : Classification of Inertsil ODS phases by Standard Reference Material 869

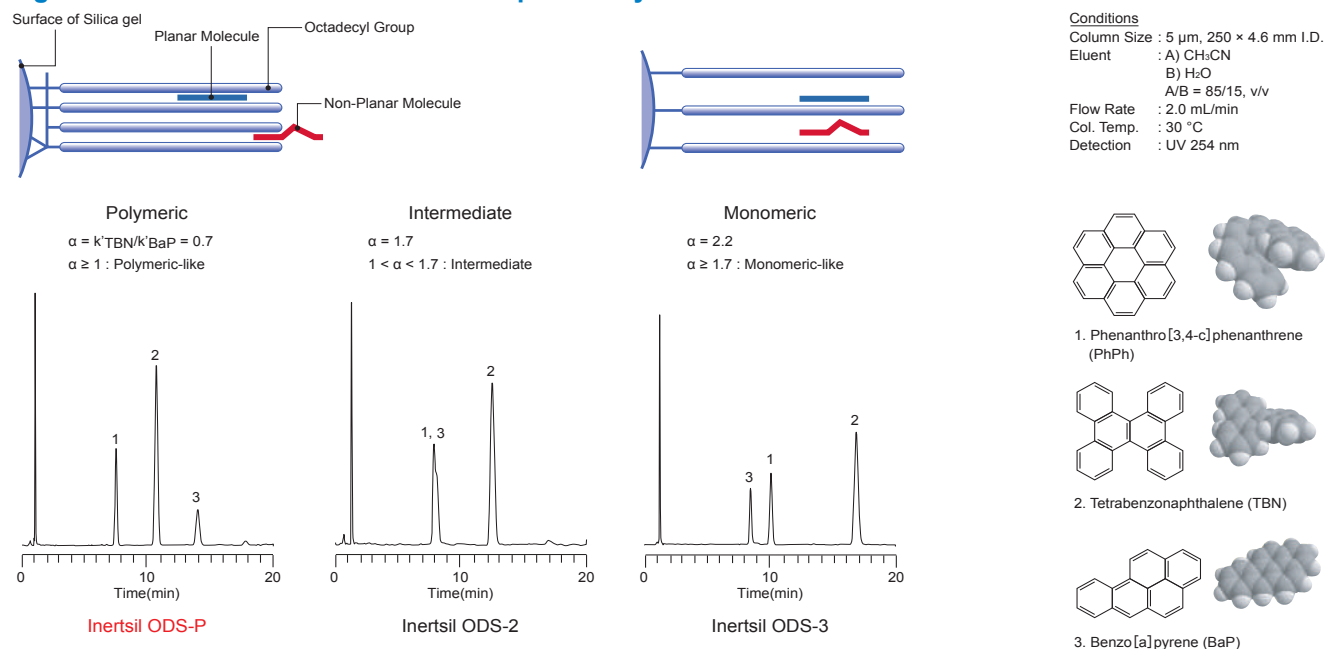
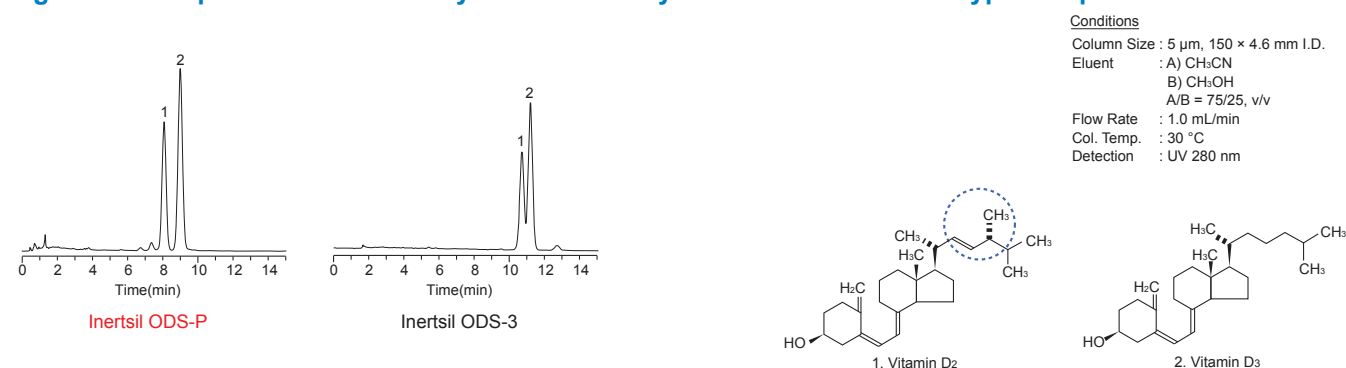


Figure 2 : Comparison of Selectivity between a Polymeric and Monomeric type C18 phase



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84731	5020-84741		
	50	5020-84732	5020-84742		
	75	5020-84733	5020-84743		
	100	5020-84734	5020-84744		
	150	5020-84735	5020-84745		
	250	5020-84736	5020-84746		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04661	5020-04671	5020-04681	5020-04691
	50	5020-04662	5020-04672	5020-04682	5020-04692
	75	5020-04663	5020-04673	5020-04683	5020-04693
	100	5020-04664	5020-04674	5020-04684	5020-04694
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84711	5020-84721		
	50	5020-84712	5020-84722		
	75	5020-84713	5020-84723		
	100	5020-84714	5020-84724		
	150	5020-84715	5020-84725		
	250	5020-84716	5020-84726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04711	5020-04721	5020-04731	5020-04741
	50	5020-04712	5020-04722	5020-04732	5020-04742
	75	5020-04713	5020-04723	5020-04733	5020-04743
	100	5020-04714	5020-04724	5020-04734	5020-04744
	150	5020-04715	5020-04725	5020-04735	5020-02001
	250	5020-04716	5020-04726	5020-04736	5020-02002

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19209	5020-19208	5020-19259	5020-19258
1.5, 2.1		1.5	5020-19309	5020-19308	5020-19359	5020-19358
2.1, 3.0		3.0	5020-19109	5020-19108	5020-19159	5020-19158
4.0, 4.6		4.0	5020-19009	5020-19008	5020-19059	5020-19058
2.1, 3.0	20	3.0	5020-19509	5020-19508	5020-19559	5020-19558
4.0, 4.6		4.0	5020-19409	5020-19408	5020-19459	5020-19458
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil ODS-EP

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : No
- Carbon Loading : 9 %
- USP Code : L1
- pH Range : 2 - 7.5



PG : Polar Group

Inertsil ODS-EP contains a polar functional group embedded between the silica surface and the C18 group.

The embedded polar group makes the C18 phase stable in 100 % aqueous eluents without "phase collapse."

This phase is also extremely "base deactivated" and provides superior peak shape for acids and bases in organic eluents as well as acidified eluents typically used in LC/MS.

Figure 1 : Comparison of Selectivity

Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3OH
 B) 10 mM KH_2PO_4 (pH 7.0, K_2HPO_4)
 A/B = 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 210 nm

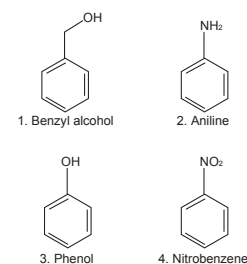
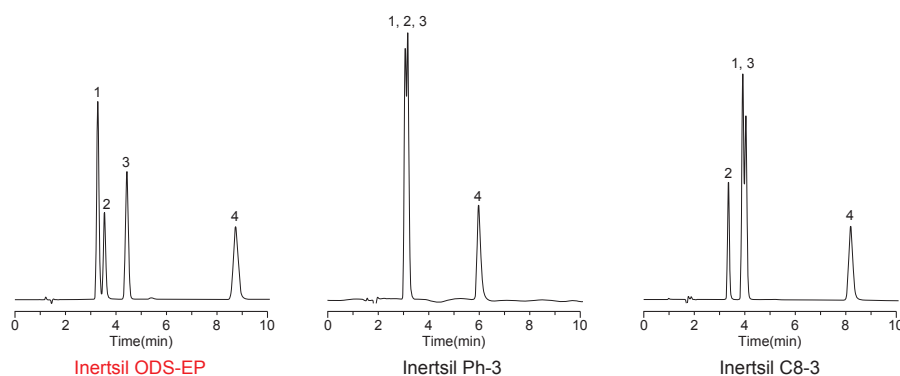
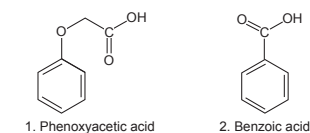
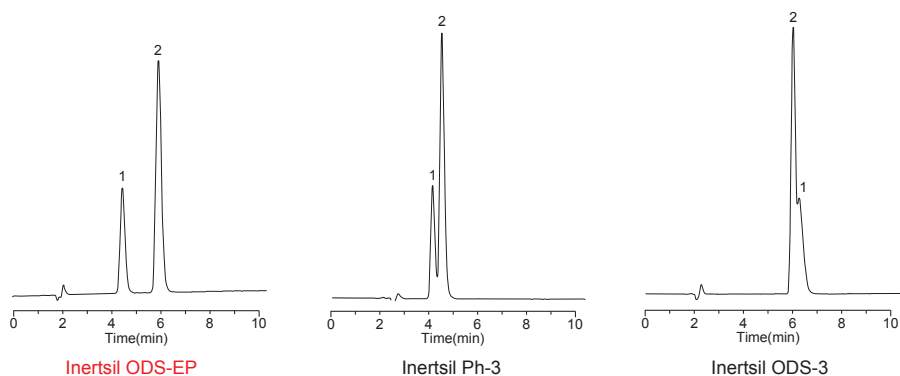


Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase

Conditions

Column Size : 5 μm , 150 $\times$ 3.0 mm I.D.
 Eluent : A) CH_3OH
 B) 0.1 % HCOOH in H_2O
 A/B = 50/50, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-18211	5020-18221		
	50	5020-18212	5020-18222		
	75	5020-18213	5020-18223		
	100	5020-18214	5020-18224		
	150	5020-18215	5020-18225		
	250	5020-18216	5020-18226		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-02611	5020-02621	5020-02631	5020-02641
	50	5020-02612	5020-02622	5020-02632	5020-02642
	75	5020-02613	5020-02623	5020-02633	5020-02643
	100	5020-02614	5020-02624	5020-02634	5020-02644
	150	5020-02615	5020-02625	5020-02635	5020-02645
	250	5020-02616	5020-02626	5020-02636	5020-02646

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19210	5020-19260
1.5, 2.1		1.5	5020-19310	5020-19360
2.1, 3.0		3.0	5020-19110	5020-19160
4.0, 4.6		4.0	5020-19010	5020-19060
2.1, 3.0	20	3.0	5020-19510	5020-19560
4.0, 4.6		4.0	5020-19410	5020-19460
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

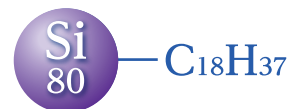
Capillary Columns

Applications

Cat. No. Index

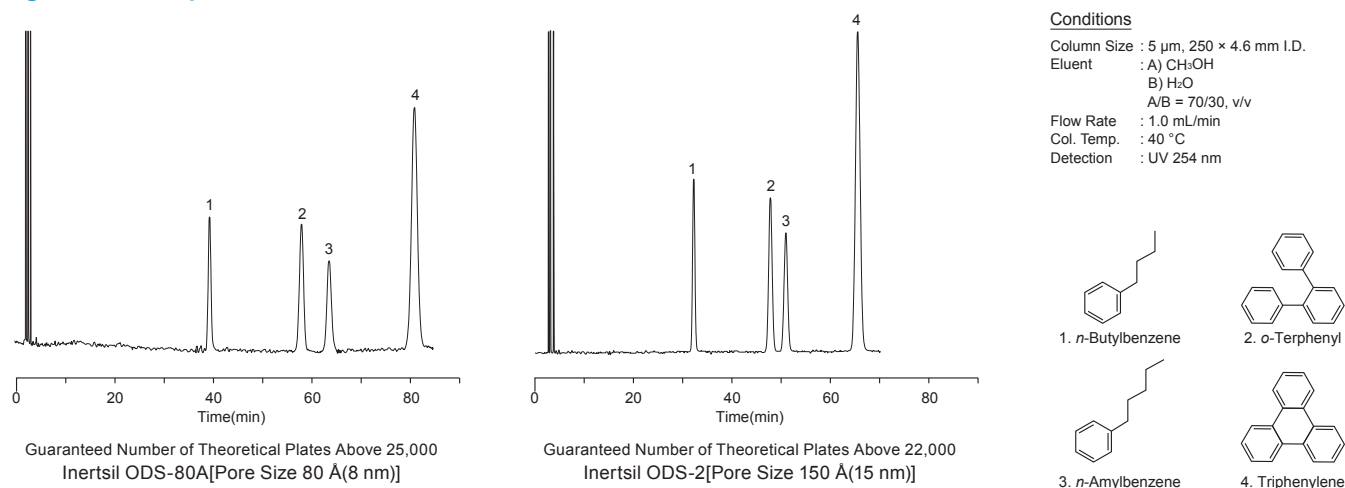
Inertsil ODS-80A

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 80 Å (8 nm)
- Pore Volume : 0.80 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 17.5 %
- USP Code : L1
- pH Range : 2 - 7.5



A relatively small pore size of 80 Å with high surface area silica delivers high number of theoretical plates for small molecule samples. GL Sciences' InertSustain C18 and Inertsil ODS-4 were a major advancement on the Inertsil ODS-80A columns, and generally provide superior chromatography and alternative selectivity to the Inertsil ODS-80A. We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison with Inertsil ODS-2



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 μm	150	5020-01621	5020-01622	5020-01623	5020-01624
	250	5020-01625	5020-01626	5020-01627	5020-01628

Cartridge Guard Column E

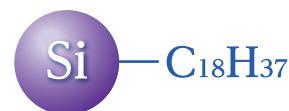
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19140	5020-19190
4.0, 4.6		4.0	5020-19040	5020-19090
2.1, 3.0	20	3.0	5020-19540	5020-19590
4.0, 4.6		4.0	5020-19440	5020-19490
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550



Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
------------------------	---------------	----------------------	-------------	----------------------	------------------------------	---------------	---------------------	-------------------	--------------	----------------

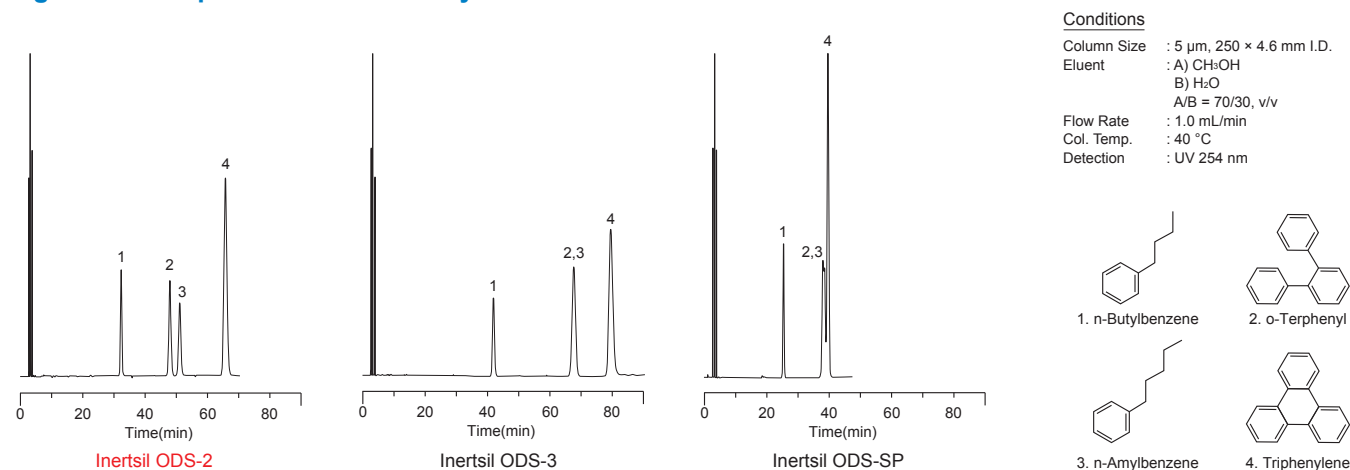
Inertsil ODS-2

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 320 m^2/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 18.5 %
- USP Code : L1
- pH Range : 2 - 7.5



Inertsil ODS-2 columns have a pore size of 150 Å offering symmetric peaks for bases, acids with low pressure. When Inertsil ODS-2 was introduced in 1987s, this HPLC transformed the entire industry. Inertsil ODS-2 was the first HPLC phase created using ultra high purity silica, which produced superior base deactivation. Until this phase was eclipsed by the performance of its sibling Inertsil ODS-4, it was GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical and environmental labs. We recommend Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison of Retentivity



Analytical Columns

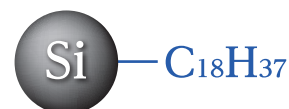
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 μm	150	5020-01121	5020-01122	5020-01123	5020-01124
	250	5020-01125	5020-01126	5020-01127	5020-01128

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 μm	5 μm
2.1, 3.0	10	3.0	5020-19135	5020-19185
4.0, 4.6		4.0	5020-19035	5020-19085
2.1, 3.0	20	3.0	5020-19535	5020-19585
4.0, 4.6		4.0	5020-19435	5020-19485
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

Inertsil ODS

- **Silica** : Spherical Silica Gel
- **Particle Size** : 5 µm, 10 µm
- **Surface Area** : 350 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.00 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 14 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5



Inertsil ODS columns are general purpose, reversed phase C18 columns available in 5 µm and 10 µm particle sizes. It was the first ODS bonded phase introduced from GL Sciences back in 1986. We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-02121	5020-02122	5020-02123	5020-02124
Particle Size: 10 µm	250	5020-02125	5020-02126	5020-02127	5020-02128
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 10 µm	150	5020-02221	5020-02222	5020-02223	5020-02224
	250	5020-02225	5020-02226	5020-02227	5020-02228

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			5 µm	10 µm	5 µm	10 µm
2.1, 3.0	10	3.0	5020-19141	5020-19142	5020-19191	5020-19192
4.0, 4.6		4.0	5020-19041	5020-19042	5020-19091	5020-19092
2.1, 3.0	20	3.0	5020-19541	5020-19542	5020-19591	5020-19592
4.0, 4.6		4.0	5020-19441	5020-19442	5020-19491	5020-19492
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain C8

- Silica : High Purity ES Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 350 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Functional Group : Octyl
- End-capping : Yes
- Carbon Loading : 8 %
- USP Code : L7
- pH Range : 1 - 10



InertSustain C8 is an octyl group (C8) bonded column delivering the same extreme inertness to any type of compounds just like InertSustain C18, which enables rapid analysis of highly hydrophobic compounds delivering symmetric peaks at a wide range of pH.

Figure 1 : Comparison of Retentivity

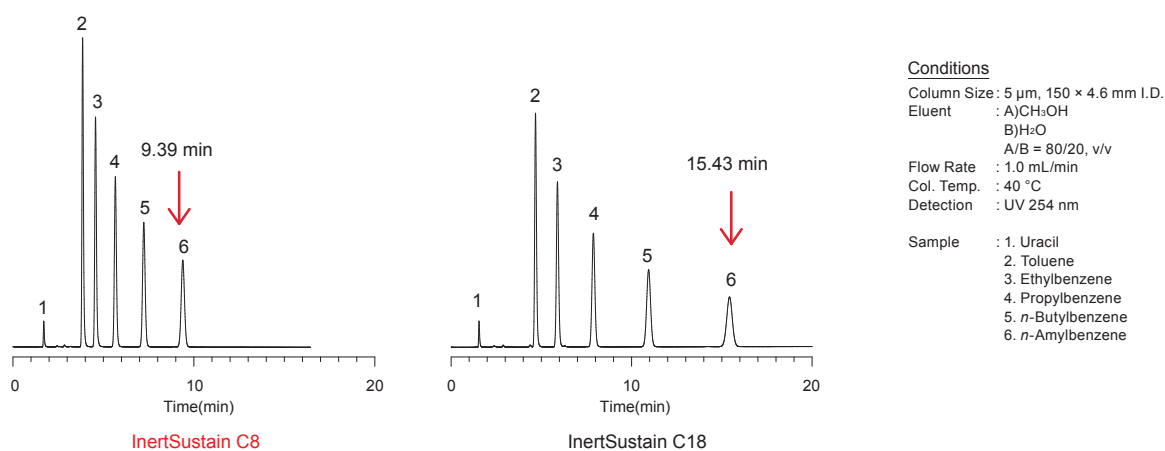
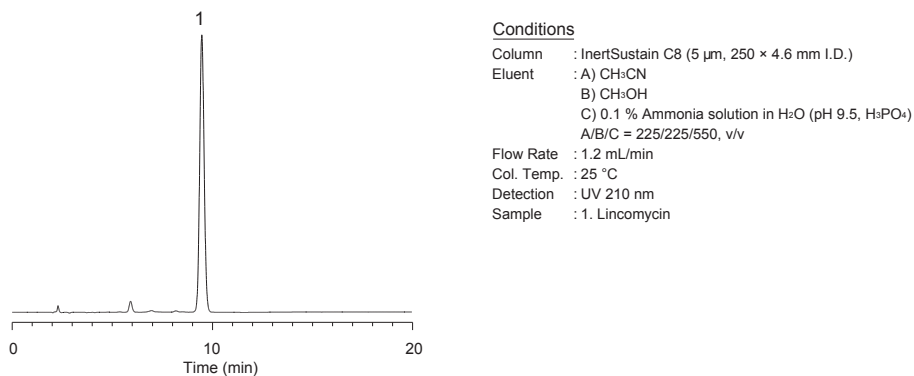


Figure 2 : Analysis of Lincomycin under Basic Condition



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-16235	5020-16240		
	50	5020-16236	5020-16241		
	75	5020-16237	5020-16242		
	100	5020-16238	5020-16243		
	150	5020-16239	5020-16244		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-16217	5020-16223	5020-16229	
	50	5020-16218	5020-16224	5020-16230	
	75	5020-16219	5020-16225	5020-16231	
	100	5020-16220	5020-16226	5020-16232	
	150	5020-16221	5020-16227	5020-16233	
Particle Size: 3 µm	250	5020-16222	5020-16228	5020-16234	
	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16168	5020-16174		
	50	5020-16169	5020-16175		
	75	5020-16170	5020-16176		
	100	5020-16171	5020-16177		
	150	5020-16172	5020-16178		
	250	5020-16173	5020-16179		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16132	5020-16139	5020-16146	5020-16153
	50	5020-16133	5020-16140	5020-16147	5020-16154
	75	5020-16134	5020-16141	5020-16148	5020-16155
	100	5020-16135	5020-16142	5020-16149	5020-16156
	125	5020-16855	5020-16856	5020-16857	5020-16858
Particle Size: 5 µm	150	5020-16136	5020-16143	5020-16150	5020-16157
	250	5020-16137	5020-16144	5020-16151	5020-16158
	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16039	5020-16045		
	50	5020-16040	5020-16046		
	75	5020-16041	5020-16047		
	100	5020-16042	5020-16048		
	150	5020-16043	5020-16049		
	250	5020-16044	5020-16050		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16002	5020-16009	5020-16016	5020-16023
	50	5020-16003	5020-16010	5020-16017	5020-16024
	75	5020-16004	5020-16011	5020-16018	5020-16025
	100	5020-16005	5020-16012	5020-16019	5020-16026
	125	5020-16851	5020-16852	5020-16853	5020-16854
	150	5020-16006	5020-16013	5020-16020	5020-16027
	250	5020-16007	5020-16014	5020-16021	5020-16028

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16207	5020-16106	5020-16208	5020-16107
1.5, 2.1		1.5	5020-16209	5020-16108	5020-16210	5020-16109
2.1, 3.0		3.0	5020-16205	5020-16104	5020-16206	5020-16105
4.0, 4.6		4.0	5020-16203	5020-16102	5020-16204	5020-16103
2.1, 3.0	20	3.0	5020-16213	5020-16112	5020-16214	5020-16113
4.0, 4.6		4.0	5020-16211	5020-16110	5020-16212	5020-16111
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

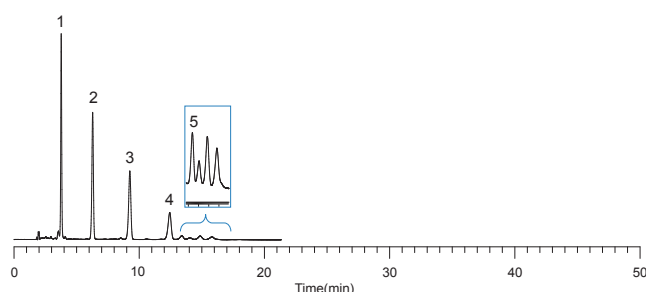
InertSustainSwift C8

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 1.9 μm , 3 μm , 5 μm
- **Surface Area** : 200 m^2/g
- **Pore Size** : 200 Å (20 nm)
- **Pore Volume** : 1.00 mL/g
- **Functional Group** : Octyl
- **End-capping** : Yes
- **Carbon Loading** : 6%
- **USP Code** : L7
- **pH Range** : 1 - 10



InertSustainSwift C8 is an octyl group (C8) bonded column offering the same extreme inertness to any type of compounds just like InertSustainSwift C18, which is ideal for analyzing low polarity analytes. In addition, the optimized 200 Å pore size silica enables to analyze and retain peptides and oligonucleotides which have a molecular weight from several kDa to several dozen kDa.

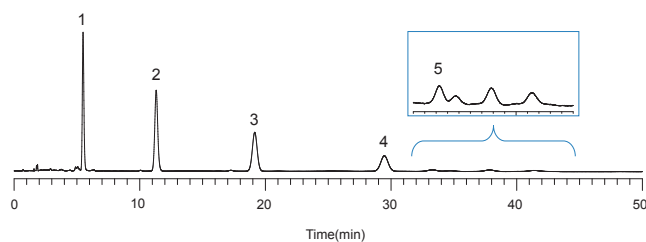
Figure 1 : Comparison of Retentivity



InertSustainSwift C8

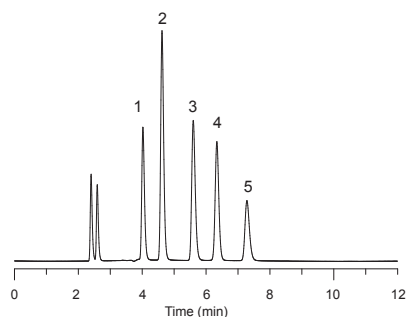
Conditions

Column Size : 5 μm 150 $\times$ 4.6 mm I.D.
 Eluent : A) H_2O
 B) CH_3CN
 A/B = 10/90, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp : 40 $^\circ\text{C}$
 Detection : UV 300 nm
 Sample : 1. Retinol (Vitamin A)
 2. Cholecalciferol (Vitamin D3)
 3. α -tocopherol (Vitamin E)
 4. Phylloquinone (Vitamin K1)
 5. Impurities of 1

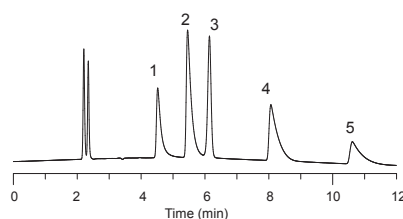


InertSustain C8

Figure 2 : Analysis of Antihistamines



InertSustainSwift C8



Hypersil BDS C8

Conditions

Column Size : 5 μm 250 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN
 B) 25 mM K_2HPO_4 (pH 7.0, KH_2PO_4)
 A/B = 60/40, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp : 40 $^\circ\text{C}$
 Detection : 230 nm
 Injection Vol. : 5 μL
 Sample : 1. Chlorpheniramine
 2. Triprolidine
 3. Homochlorcyclizine
 4. Hydroxyzine
 5. Clemastine

Analytical Columns

Particle Size: 1.9 µm	Length \ I.D. (mm)	2.1	3.0		
	50	5020-88533	5020-88536		
	100	5020-88534	5020-88537		
	150	5020-88535	5020-88538		
HP Series Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	50	5020-88515	5020-88519	5020-88523	
	100	5020-88516	5020-88520	5020-88524	
	150	5020-88517	5020-88521	5020-88525	
	250	5020-88518	5020-88522	5020-88526	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88466	5020-88472		
	50	5020-88467	5020-88473		
	75	5020-88468	5020-88474		
	100	5020-88469	5020-88475		
	150	5020-88470	5020-88476		
	250	5020-88471	5020-88477		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88426	5020-88434	5020-88442	5020-88450
	50	5020-88427	5020-88435	5020-88443	5020-88451
	75	5020-88428	5020-88436	5020-88444	5020-88452
	100	5020-88429	5020-88437	5020-88445	5020-88453
	125	5020-88430	5020-88438	5020-88446	5020-88454
	150	5020-88431	5020-88439	5020-88447	5020-88455
	250	5020-88432	5020-88440	5020-88448	5020-88456
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88342	5020-88348		
	50	5020-88343	5020-88349		
	75	5020-88344	5020-88350		
	100	5020-88345	5020-88351		
	150	5020-88346	5020-88352		
	250	5020-88347	5020-88353		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88302	5020-88310	5020-88318	5020-88326
	50	5020-88303	5020-88311	5020-88319	5020-88327
	75	5020-88304	5020-88312	5020-88320	5020-88328
	100	5020-88305	5020-88313	5020-88321	5020-88329
	125	5020-88306	5020-88314	5020-88322	5020-88330
	150	5020-88307	5020-88315	5020-88323	5020-88331
	250	5020-88308	5020-88316	5020-88324	5020-88332

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-88505	5020-88409	5020-88506	5020-88410
1.5, 2.1		1.5	5020-88507	5020-88411	5020-88508	5020-88412
2.1, 3.0		3.0	5020-88503	5020-88407	5020-88504	5020-88408
4.0, 4.6		4.0	5020-88501	5020-88405	5020-88502	5020-88406
2.1, 3.0	20	3.0	5020-88511	5020-88415	5020-88512	5020-88416
4.0, 4.6		4.0	5020-88509	5020-88413	5020-88510	5020-88414
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

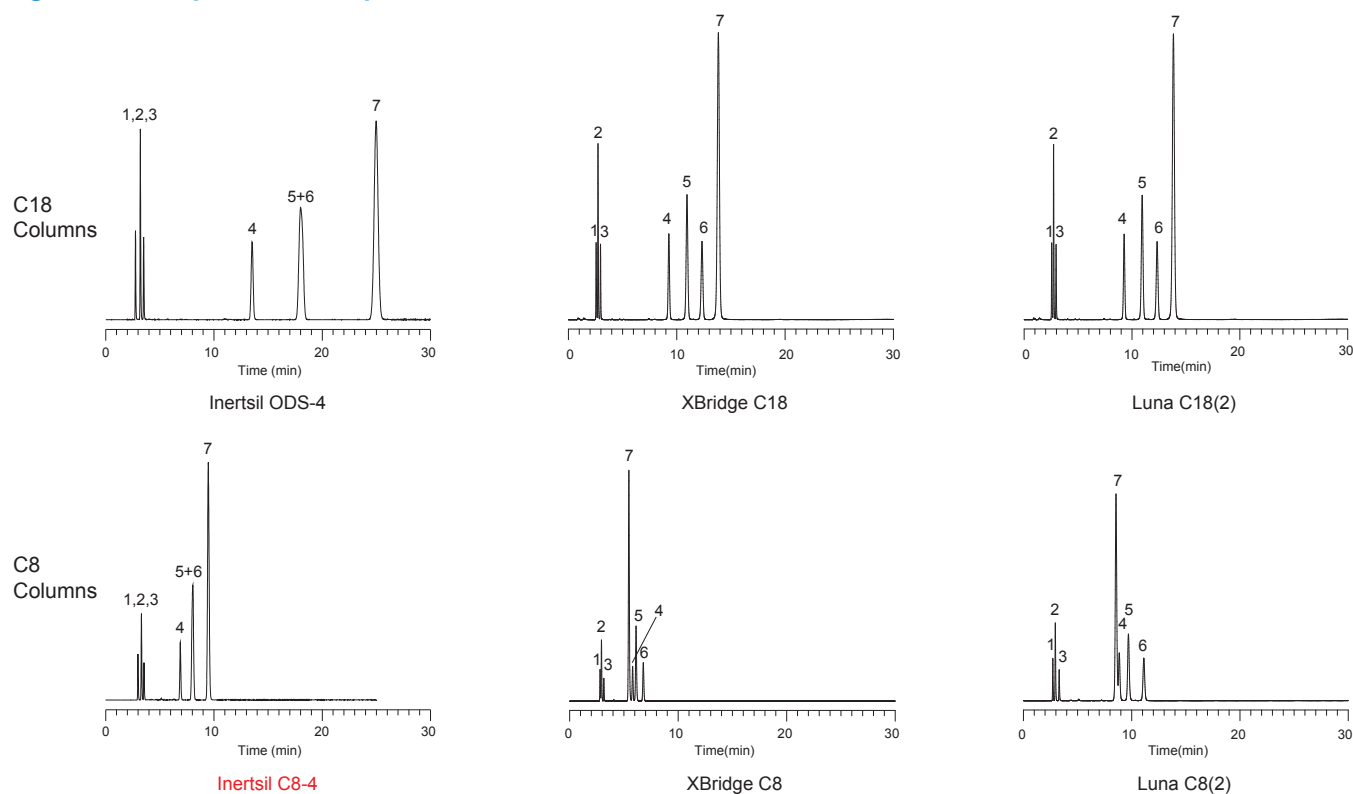
Inertsil C8-4

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octyl
- End-capping : Yes
- Carbon Loading : 5 %
- USP Code : L7
- pH Range : 2 - 7.5



Many chromatographers prefer a C8 column when an ODS phase shows excessive retention values. Inertsil C8-4 provides the same separation pattern (selectivity) and extreme inertness to any type of compounds just like Inertsil ODS-4, which enables easy method transfer from ODS-4 to C8-4 while other commercially available ODS and C8 columns can show dramatically different selectivity even though they are part of the same brand/series.

Figure 1 : Comparison of Separation Pattern between C18 and C8 Columns



Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D.

Eluent : A) CH₃OH

B) H₂O

A / B = 80/20, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 °C

Detection : UV 254 nm

Injection Vol. : 5 µL

1. Uracil (0.005 mg/mL)

2. Caffeine (0.04 mg/mL)

3. Phenol (0.08 mg/mL)

4. *n*-Butylbenzene (1.12 mg/mL)

5. *o*-Terphenyl (0.04 mg/mL)

6. *n*-Amylbenzene (1.37 mg/mL)

7. Triphenylene (0.014 mg/mL)

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-81280	5020-81290		
	50	5020-81282	5020-81292		
	75	5020-81283	5020-81293		
	100	5020-81284	5020-81294		
	150	5020-81285	5020-81295		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-14071	5020-14074	5020-14077	
	50	5020-14072	5020-14075	5020-14078	
	75	5020-14073	5020-14076	5020-14079	
	100	5020-14051	5020-14054	5020-14057	
	150	5020-14052	5020-14055	5020-14058	
	250	5020-14053	5020-14056	5020-14059	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81261	5020-81271		
	50	5020-81262	5020-81272		
	75	5020-81263	5020-81273		
	100	5020-81264	5020-81274		
	150	5020-81265	5020-81275		
	250	5020-81266	5020-81276		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-03971	5020-03978	5020-03985	5020-03992
	50	5020-03972	5020-03979	5020-03986	5020-03993
	75	5020-03973	5020-03980	5020-03987	5020-03994
	100	5020-03974	5020-03981	5020-03988	5020-03995
	125	5020-03977	5020-03984	5020-03991	5020-03998
	150	5020-03975	5020-03982	5020-03989	5020-03996
	250	5020-03976	5020-03983	5020-03990	5020-03997
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81221	5020-81231		
	50	5020-81222	5020-81232		
	75	5020-81223	5020-81233		
	100	5020-81224	5020-81234		
	150	5020-81225	5020-81235		
	250	5020-81226	5020-81236		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-04051	5020-04061	5020-04071	5020-04081
	50	5020-04052	5020-04062	5020-04072	5020-04082
	75	5020-04053	5020-04063	5020-04073	5020-04083
	100	5020-04054	5020-04064	5020-04074	5020-04084
	125	5020-04057	5020-04067	5020-04077	5020-04080
	150	5020-04055	5020-04065	5020-04075	5020-04085
	250	5020-04056	5020-04066	5020-04076	5020-04086

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19247	5020-19246	5020-19297	5020-19296
1.5, 2.1		1.5	5020-19347	5020-19346	5020-19397	5020-19396
2.1, 3.0		3.0	5020-19147	5020-19146	5020-19197	5020-19196
4.0, 4.6		4.0	5020-19047	5020-19046	5020-19097	5020-19096
2.1, 3.0	20	3.0	5020-19547	5020-19546	5020-19597	5020-19596
4.0, 4.6		4.0	5020-19447	5020-19446	5020-19497	5020-19496
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil C8-3

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 μm , 3 μm , 5 μm , 10 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octyl
- End-capping : Yes
- Carbon Loading : 9 %
- USP Code : L7
- pH Range : 2 - 7.5



The same base silica gel and bonding technology that is used for Inertsil ODS-3 is also employed for Inertsil C8-3.

The difference between the two phases is just the length of the hydrocarbon ligands. As shown in Figure 2, 10 μm particle size columns are also available to meet the requirement of various pharmacopeia methods. We recommend InertSustain C8 columns for all new method development.

Figure 1 : Comparison of Retentivity

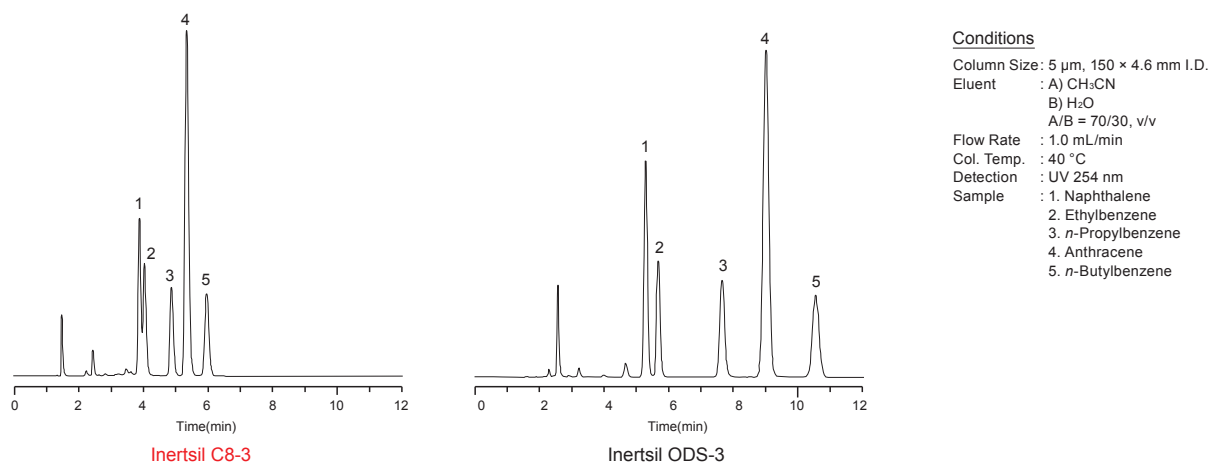
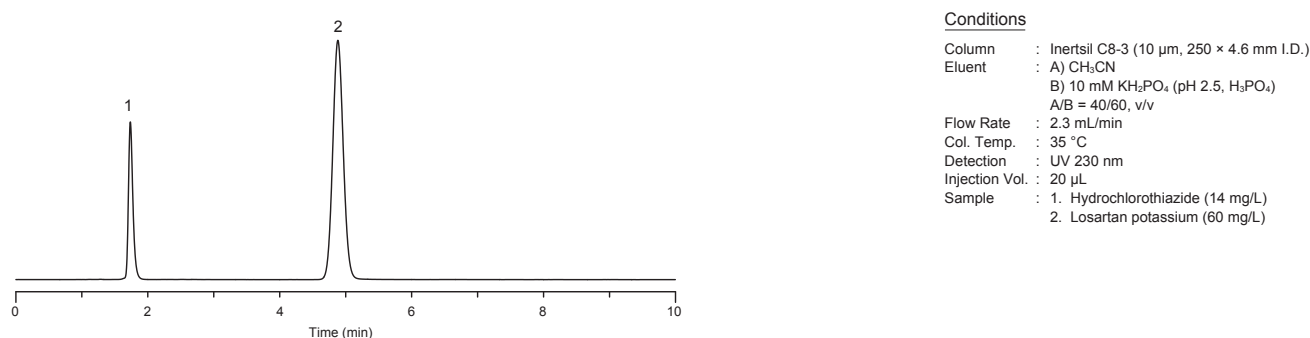


Figure 2 : Analysis of Losartan Potassium and Hydrochlorothiazide Tablets, Dissolution Test (Based on the Condition of United States Pharmacopeia 36-NF 31)



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-84930	5020-84935		
	50	5020-84931	5020-84936		
	75	5020-84932	5020-84937		
	100	5020-84933	5020-84938		
	150	5020-84934	5020-84939		
HP Series Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-14101	5020-14104	5020-14107	
	50	5020-14102	5020-14105	5020-14108	
	75	5020-14103	5020-14106	5020-14109	
	100	5020-14031	5020-14034	5020-14037	
	150	5020-14032	5020-14035	5020-14038	
	250	5020-14033	5020-14036	5020-14039	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84811	5020-84821		
	50	5020-84812	5020-84822		
	75	5020-84813	5020-84823		
	100	5020-84814	5020-84824		
	150	5020-13522	5020-13520		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04811	5020-04821	5020-04831	5020-04841
	50	5020-04812	5020-04822	5020-04832	5020-04842
	75	5020-04813	5020-04823	5020-04833	5020-01910
	100	5020-04814	5020-04824	5020-01913	5020-04844
	125	5020-04817	5020-04827	5020-04837	5020-04845
	150	5020-04815	5020-04825	5020-04835	5020-01911
	250	5020-04816	5020-04826	5020-04836	5020-01912
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84911	5020-84921		
	50	5020-84912	5020-84922		
	75	5020-84913	5020-84923		
	100	5020-84914	5020-84924		
	150	5020-13512	5020-13510		
	250	5020-84916	5020-84926		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04911	5020-04921	5020-04931	5020-04941
	50	5020-04912	5020-04922	5020-04932	5020-04942
	75	5020-04913	5020-04923	5020-04933	5020-04943
	100	5020-04914	5020-04924	5020-04934	5020-04944
	125	5020-04917	5020-04927	5020-04935	5020-04945
	150	5020-04915	5020-04925	5020-01902	5020-01900
	250	5020-04916	5020-04926	5020-01903	5020-01901
Particle Size: 10 µm	Length \ I.D. (mm)	4.6			
	150	5020-01641			
	250	5020-01642			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19215	5020-19214	5020-19265	5020-19264
1.5, 2.1		1.5	5020-19315	5020-19314	5020-19365	5020-19364
2.1, 3.0		3.0	5020-19115	5020-19114	5020-19165	5020-19164
4.0, 4.6		4.0	5020-19015	5020-19014	5020-19065	5020-19064
2.1, 3.0	20	3.0	5020-19515	5020-19514	5020-19565	5020-19564
4.0, 4.6		4.0	5020-19415	5020-19414	5020-19465	5020-19464
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil C8

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 320 m²/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Functional Group : Octyl
- End-capping : Yes
- Carbon Loading : 10.5 %
- USP Code : L7
- pH Range : 2 - 7.5



Inertsil C8 columns have a pore size of 150 Å and it is recommended for rapid analysis of highly hydrophobic compounds. We recommend InertSustain C8 or Inertsil C8-4 columns for all new method development.

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01221	5020-01222	5020-01223	5020-01224
	250	5020-01225	5020-01226	5020-01227	5020-01228

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19136	5020-19186
4.0, 4.6		4.0	5020-19036	5020-19086
2.1, 3.0	20	3.0	5020-19536	5020-19586
4.0, 4.6		4.0	5020-19436	5020-19486
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

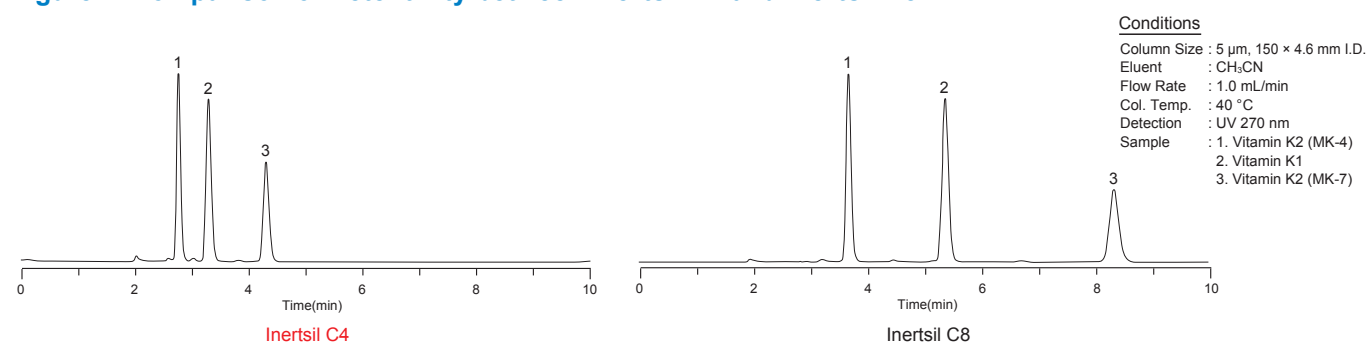


- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 320 m^2/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Functional Group : Butyl
- End-capping : Yes
- Carbon Loading : 7.5 %
- USP Code : L26
- pH Range : 2 - 7.5



Inertsil C4 columns have a pore size of 150 Å and is recommended for rapid analysis of highly hydrophobic compounds such as fat-soluble vitamins.

Figure 1: Comparison of Retentivity between Inertsil C4 and Inertsil C8



Analytical Columns

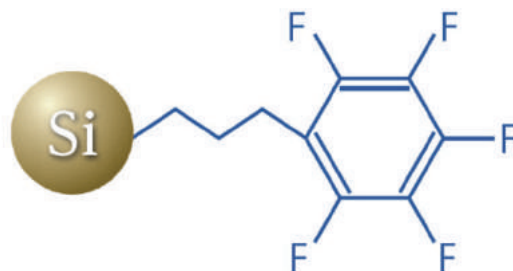
Particle Size: 5 μm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01421	5020-01422	5020-01423	5020-01424
	250	5020-01425	5020-01426	5020-01427	5020-01428

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 μm	5 μm
2.1, 3.0	10	3.0	5020-19138	5020-19188
4.0, 4.6		4.0	5020-19038	5020-19088
2.1, 3.0	20	3.0	5020-19538	5020-19588
4.0, 4.6		4.0	5020-19438	5020-19488
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

InertSustain PFP

- Base Material : High Purity ES Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 350 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Functional Group : Pentafluorophenyl
- End-capping : Yes
- Carbon Loading : 10%
- USP Code : L43
- pH Range : 2 - 7.5



InertSustain PFP columns are bonded with pentafluorophenyl groups to our newly developed ES silica gel, which delivers unique separation patterns with excellent peak shape and sensitivity. The chromatographic difference stems from the fact that the PFP phases provide interactions such as π - π , dipole, hydrogen bonding, and ionic interactions unlike conventional PFP columns.

Figure 1 : Comparison of selectivity between reversed phase columns

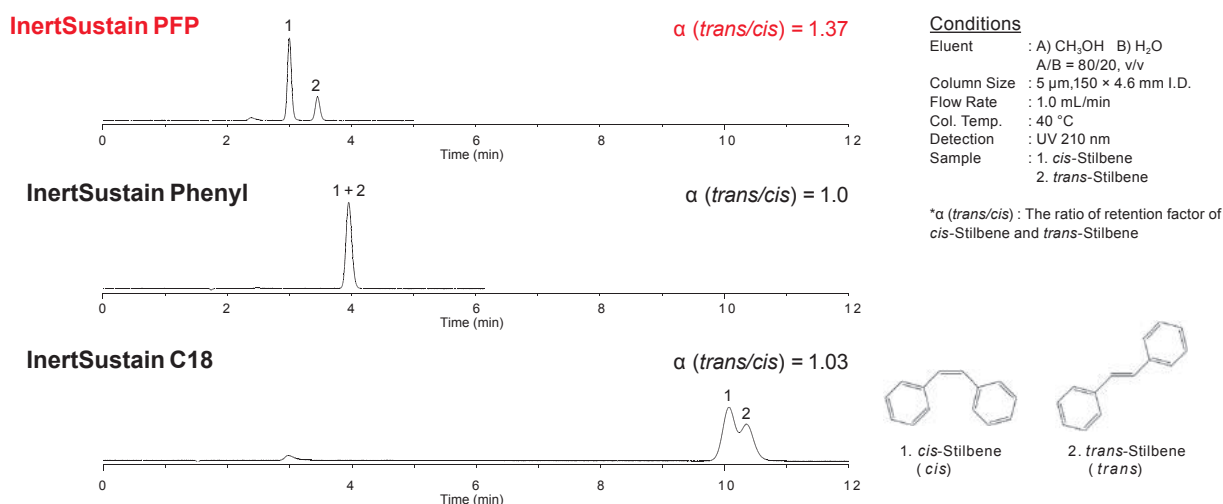
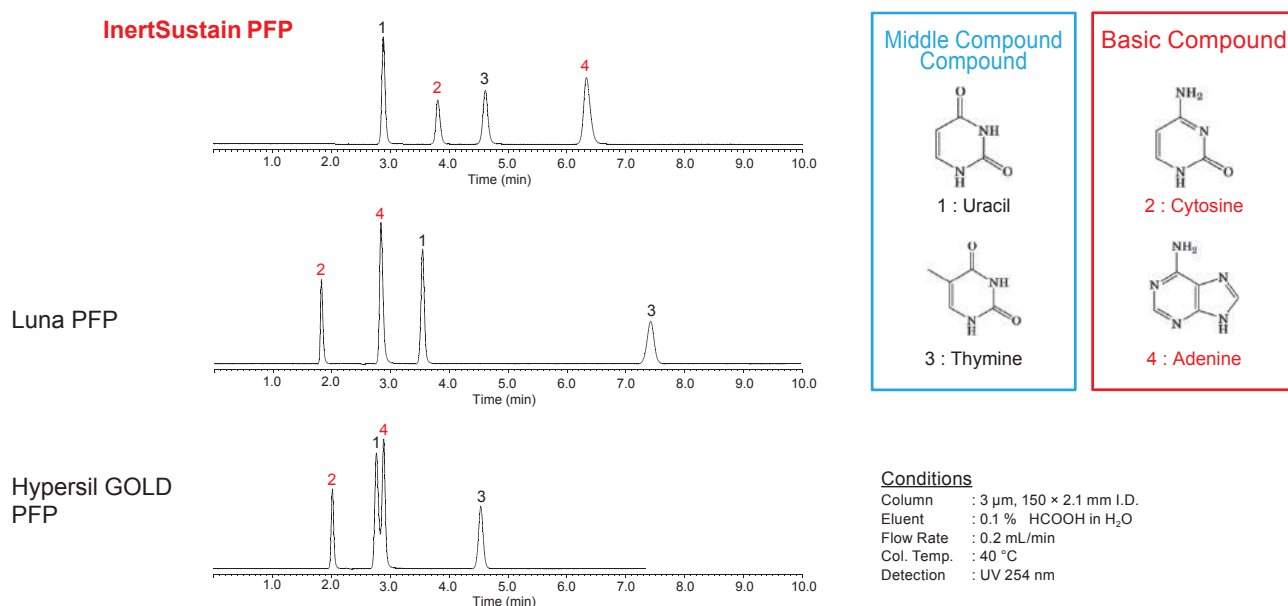


Figure 2: Comparison of high polarity compounds analysis



Analytical Columns

HP Series Particle Size: 3 μm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-87917	5020-87923	5020-87929	
	50	5020-87918	5020-87924	5020-87930	
	75	5020-87919	5020-87925	5020-87931	
	100	5020-87920	5020-87926	5020-87932	
	150	5020-87921	5020-87927	5020-87933	
	250	5020-87922	5020-87928	5020-87934	

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-87868	5020-87874		
	50	5020-87869	5020-87875		
	75	5020-87870	5020-87876		
	100	5020-87871	5020-87877		
	150	5020-87872	5020-87878		
	250	5020-87873	5020-87879		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87828	5020-87836	5020-87844	5020-87852
	50	5020-87829	5020-87837	5020-87845	5020-87853
	75	5020-87830	5020-87838	5020-87846	5020-87854
	100	5020-87831	5020-87839	5020-87847	5020-87855
	125	5020-87832	5020-87840	5020-87848	5020-87856
	150	5020-87833	5020-87841	5020-87849	5020-87857
	250	5020-87834	5020-87842	5020-87850	5020-87858

Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-87741	5020-87747		
	50	5020-87742	5020-87748		
	75	5020-87743	5020-87749		
	100	5020-87744	5020-87750		
	150	5020-87745	5020-87751		
	250	5020-87746	5020-87752		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87701	5020-87709	5020-87717	5020-87725
	50	5020-87702	5020-87710	5020-87718	5020-87726
	75	5020-87703	5020-87711	5020-87719	5020-87727
	100	5020-87704	5020-87712	5020-87720	5020-87728
	125	5020-87705	5020-87713	5020-87721	5020-87729
	150	5020-87706	5020-87714	5020-87722	5020-87730
	250	5020-87707	5020-87715	5020-87723	5020-87731

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-87907	5020-87807	5020-87908	5020-87808
1.5, 2.1		1.5	5020-87909	5020-87809	5020-87910	5020-87810
2.1, 3.0		3.0	5020-87905	5020-87805	5020-87906	5020-87806
4.0, 4.6		4.0	5020-87903	5020-87803	5020-87904	5020-87804
2.1, 3.0	20	3.0	5020-87913	5020-87813	5020-87914	5020-87814
4.0, 4.6		4.0	5020-87911	5020-87811	5020-87912	5020-87812
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

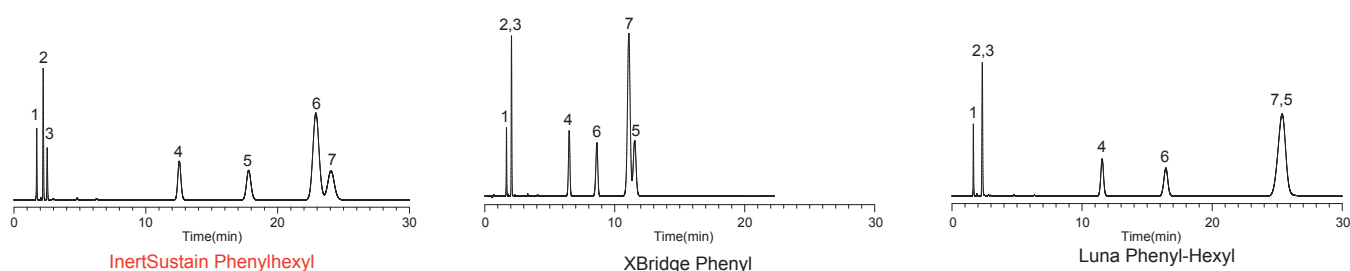
InertSustain Phenylhexyl

- **Silica** : High Purity ES Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 350 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Phenylhexyl
- **End-capping** : Yes
- **Carbon Loading** : 9.0 %
- **USP Code** : L11
- **pH Range** : 1 - 10



InertSustain Phenylhexyl columns are bonded with phenylhexyl groups, which employs a phenyl ring with a hexyl (6-carbon) linker and is densely bonded to our newly developed ES silica gel delivering complementary selectivity to straight alkyl-chain columns, but with industry leading inertness, lot-to-lot reproducibility and low back pressure.

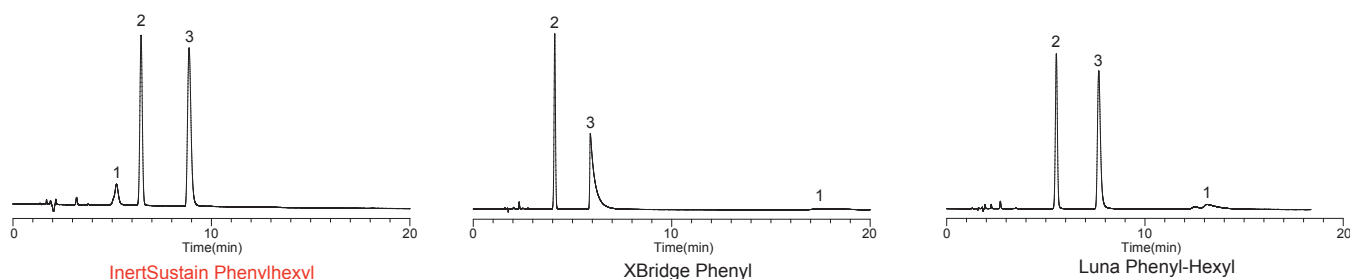
Figure 1 : Comparison of Selectivity



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D. Sample : 1. Uracil
 Eluent : A) CH_3OH 2. Caffeine
 B) H_2O 3. Phenol
 A/B = 70/30, v/v 4. Butylbenzene
 Flow Rate : 1.0 mL / min 5. o-Terphenyl
 Col. Temp. : 40 $^\circ\text{C}$ 6. Amylbenzene
 Detection : UV 254 nm 7. Triphenylene

Figure 2 : Analysis of Acidic Compounds



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D. Sample : 1. Brilliant Blue FCF
 Eluent : A) CH_3CN 2. Phenol
 B) 0.1% H_3PO_4 3. Salicylic acid
 A/B = 25/75, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm

Analytical Columns

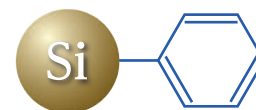
HP Series Particle Size: 3 μm 50 MPa (500 bar)	Length \ I.D.(mm)	2.1	3.0	4.6	
	30	5020-89209	5020-89215	5020-89221	
	50	5020-89210	5020-89216	5020-89222	
	75	5020-89211	5020-89217	5020-89223	
	100	5020-89212	5020-89218	5020-89224	
	150	5020-89213	5020-89219	5020-89225	
	250	5020-89214	5020-89220	5020-89226	
Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89160	5020-89166		
	50	5020-89161	5020-89167		
	75	5020-89162	5020-89168		
	100	5020-89163	5020-89169		
	150	5020-89164	5020-89170		
	250	5020-89165	5020-89171		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89124	5020-89131	5020-89138	5020-89145
	50	5020-89125	5020-89132	5020-89139	5020-89146
	75	5020-89126	5020-89133	5020-89140	5020-89147
	100	5020-89127	5020-89134	5020-89141	5020-89148
	150	5020-89128	5020-89135	5020-89142	5020-89149
	250	5020-89129	5020-89136	5020-89143	5020-89150
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89038	5020-89044		
	50	5020-89039	5020-89045		
	75	5020-89040	5020-89046		
	100	5020-89041	5020-89047		
	150	5020-89042	5020-89048		
	250	5020-89043	5020-89049		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89001	5020-89008	5020-89015	5020-89022
	50	5020-89002	5020-89009	5020-89016	5020-89023
	75	5020-89003	5020-89010	5020-89017	5020-89024
	100	5020-89004	5020-89011	5020-89018	5020-89025
	150	5020-89005	5020-89012	5020-89019	5020-89026
	250	5020-89006	5020-89013	5020-89020	5020-89027

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-89199	5020-89105	5020-89200	5020-89106
1.5, 2.1		1.5	5020-89201	5020-89107	5020-89202	5020-89108
2.1, 3.0		3.0	5020-89197	5020-89103	5020-89198	5020-89104
4.0, 4.6		4.0	5020-89195	5020-89101	5020-89196	5020-89102
2.1, 3.0	20	3.0	5020-89205	5020-89111	5020-89206	5020-89112
4.0, 4.6		4.0	5020-89203	5020-89109	5020-89204	5020-89110
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

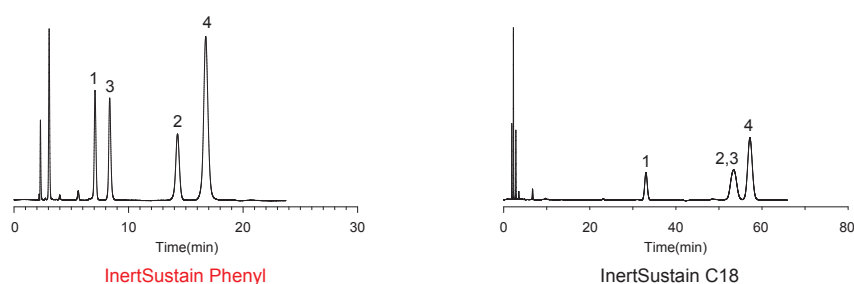
InertSustain Phenyl

- Silica : High Purity ES Silica Gel
- Particle Size : 2 μm, 3 μm, 5 μm
- Surface Area : 350 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Functional Group : Phenyl
- End-capping : No
- Carbon Loading : 10 %
- USP Code : L11
- pH Range : 2 - 7.5



InertSustain Phenyl delivers an extremely unique reverse phase characteristics that are critical to resolving compounds that could not be separated on a C18 or C8 phase. InertSustain Phenyl provides not only pi-pi interactions, but also hydrogen bonding secondary interactions, which results in retaining polar compounds at the same time. As the phenyl groups are directly bonded to the silica gel, InertSustain Phenyl is compatible with the analysis of structural isomers due to its high stereo-selectivity (Figure 2) while other alkyl phenyl type columns fails to separate.

Figure 1 : Comparison of Selectivity



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.

Eluent : A) CH₃OH

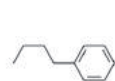
B) H_2O

$$A/B = 70/30, v/v$$

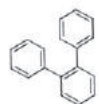
Flow Rate : 0.8 mL/min

Col. Temp.

Detection : UV 254 nm

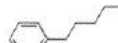


1. Butylbenzene



2,0 -Terphenyl

Non - Planar Structure



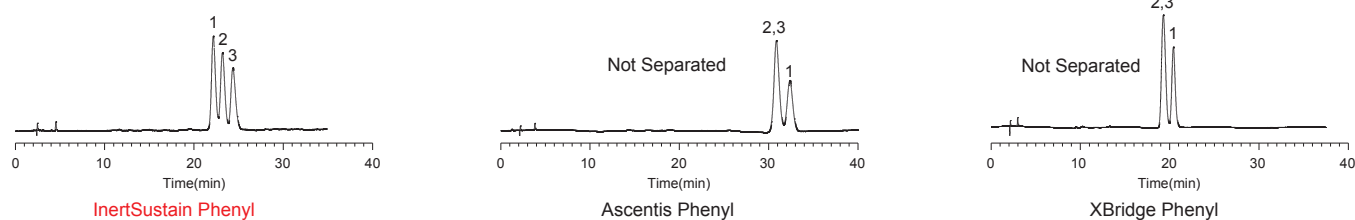
3. Amylbenzene



4. Triphenylene

Planar Structure

Figure 2 : Analysis of Structural Isomers (Positional Isomers of Cresol)



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.

Eluent : A)CH₃OH

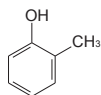
B) H_2O

$$A/B = 20/80, v/v$$

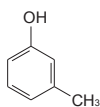
Col. Temp.

Flow Rate : 0.8 mL/min

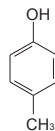
Detection : UV 254 nm



1. *o*-Cresol



2. *m*-Cresol



3. *p*-Cresol

Analytical Columns

Particle Size: 2 µm	Length \ I.D.(mm)	2.1	3.0		
	30	5020-16535	5020-16540		
	50	5020-16536	5020-16541		
	75	5020-16537	5020-16542		
	100	5020-16538	5020-16543		
	150	5020-16539	5020-16544		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-16517	5020-16523	5020-16529	
	50	5020-16518	5020-16524	5020-16530	
	75	5020-16519	5020-16525	5020-16531	
	100	5020-16520	5020-16526	5020-16532	
	150	5020-16521	5020-16527	5020-16533	
	250	5020-16522	5020-16528	5020-16534	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16468	5020-16474		
	50	5020-16469	5020-16475		
	75	5020-16470	5020-16476		
	100	5020-16471	5020-16477		
	150	5020-16472	5020-16478		
	250	5020-16473	5020-16479		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16432	5020-16439	5020-16446	5020-16453
	50	5020-16433	5020-16440	5020-16447	5020-16454
	75	5020-16434	5020-16441	5020-16448	5020-16455
	100	5020-16435	5020-16442	5020-16449	5020-16456
	150	5020-16436	5020-16443	5020-16450	5020-16457
	250	5020-16437	5020-16444	5020-16451	5020-16458
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16339	5020-16345		
	50	5020-16340	5020-16346		
	75	5020-16341	5020-16347		
	100	5020-16342	5020-16348		
	150	5020-16343	5020-16349		
	250	5020-16344	5020-16350		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16302	5020-16309	5020-16316	5020-16323
	50	5020-16303	5020-16310	5020-16317	5020-16324
	75	5020-16304	5020-16311	5020-16318	5020-16325
	100	5020-16305	5020-16312	5020-16319	5020-16326
	150	5020-16306	5020-16313	5020-16320	5020-16327
	250	5020-16307	5020-16314	5020-16321	5020-16328

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16507	5020-16406	5020-16508	5020-16407
1.5, 2.1		1.5	5020-16509	5020-16408	5020-16510	5020-16409
2.1, 3.0		3.0	5020-16505	5020-16404	5020-16506	5020-16405
4.0, 4.6		4.0	5020-16503	5020-16402	5020-16504	5020-16403
2.1, 3.0	20	3.0	5020-16513	5020-16412	5020-16514	5020-16413
4.0, 4.6		4.0	5020-16511	5020-16410	5020-16512	5020-16411
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil Ph-3

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 μm , 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Phenyl Groups
- End-capping : No
- Carbon Loading : 9.5 %
- USP Code : L11
- pH Range : 2 - 7.5



Just like InertSustain Phenyl, Inertsil Ph-3 have phenyl groups directly bonded to the silica gel which provides pure reverse phase characteristics that are critical to resolving highly polar compounds like acidic and basic pharmaceuticals. The near perfect phenyl phase coverage on this material results in symmetric, narrow peaks for even the most polar compounds while using simple eluents like aqueous acetonitrile or methanol.

Figure 1 : Comparison of Selectivity with Inertsil ODS-3

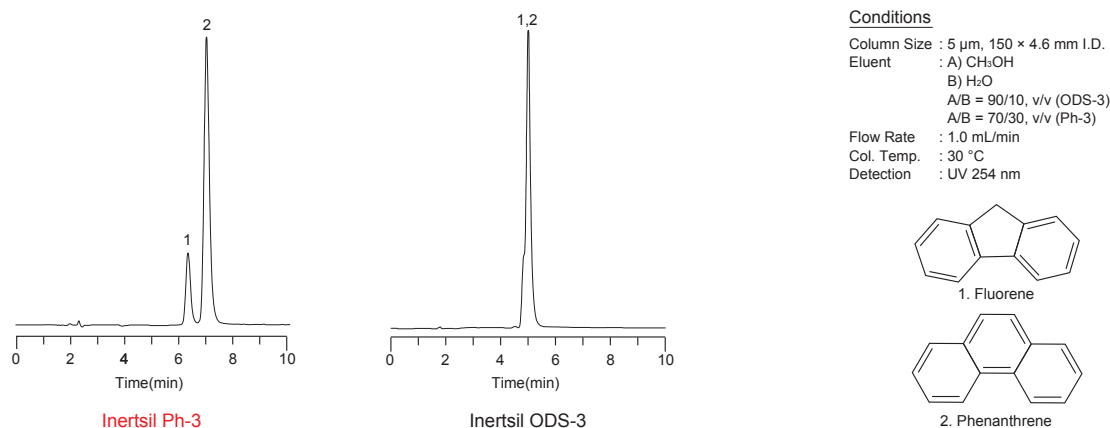
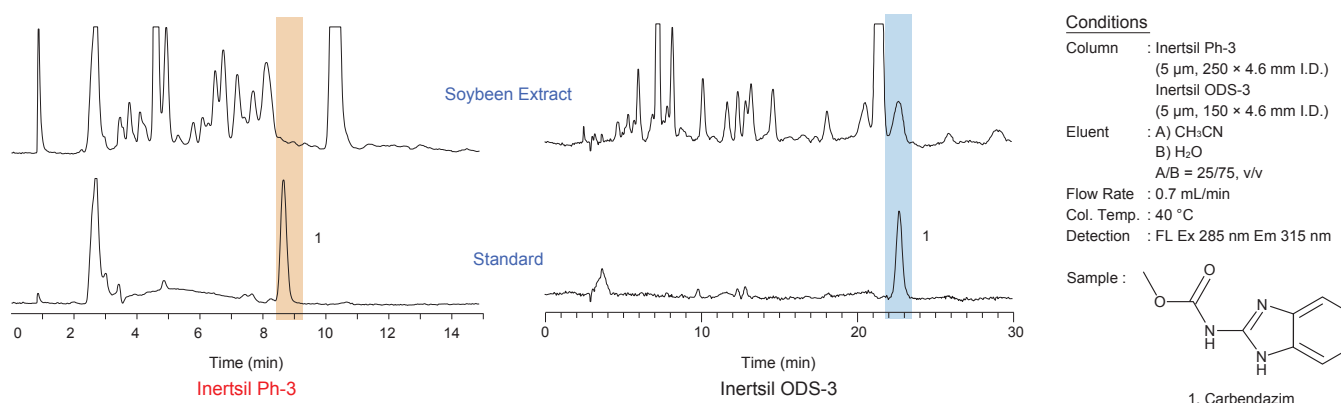


Figure 2 : Application on Pesticide Detection Test



Analytical Columns

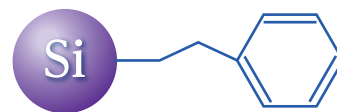
Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-85130	5020-85135		
	50	5020-85131	5020-85136		
	75	5020-85132	5020-85137		
	100	5020-85133	5020-85138		
	150	5020-85134	5020-85139		
HPSeries Particle Size: 3 µm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-14111	5020-14114	5020-14117	
	50	5020-14112	5020-14115	5020-14118	
	75	5020-14113	5020-14116	5020-14119	
	100	5020-14041	5020-14044	5020-14047	
	150	5020-14042	5020-14045	5020-14048	
	250	5020-14043	5020-14046	5020-14049	
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85011	5020-85021		
	50	5020-85012	5020-85022		
	75	5020-85013	5020-85023		
	100	5020-85014	5020-85024		
	150	5020-13622	5020-13620		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05011	5020-05021	5020-05031	5020-05041
	50	5020-05012	5020-05022	5020-05032	5020-05042
	75	5020-05013	5020-05023	5020-05033	5020-01930
	100	5020-05014	5020-05024	5020-01933	5020-05044
	150	5020-05015	5020-05025	5020-05035	5020-01931
	250	5020-05016	5020-05026	5020-05036	5020-01932
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85111	5020-85121		
	50	5020-85112	5020-85122		
	75	5020-85113	5020-85123		
	100	5020-85114	5020-85124		
	150	5020-13612	5020-13610		
	250	5020-85116	5020-85126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05111	5020-05121	5020-05131	5020-05141
	50	5020-05112	5020-05122	5020-05132	5020-05142
	75	5020-05113	5020-05123	5020-05133	5020-05143
	100	5020-05114	5020-05124	5020-05134	5020-05144
	150	5020-05115	5020-05125	5020-01922	5020-01920
	250	5020-05116	5020-05126	5020-01923	5020-01921

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19217	5020-19216	5020-19267	5020-19266
1.5, 2.1		1.5	5020-19317	5020-19316	5020-19367	5020-19366
2.1, 3.0		3.0	5020-19117	5020-19116	5020-19167	5020-19166
4.0, 4.6		4.0	5020-19017	5020-19016	5020-19067	5020-19066
2.1, 3.0	20	3.0	5020-19517	5020-19516	5020-19567	5020-19566
4.0, 4.6		4.0	5020-19417	5020-19416	5020-19467	5020-19466
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

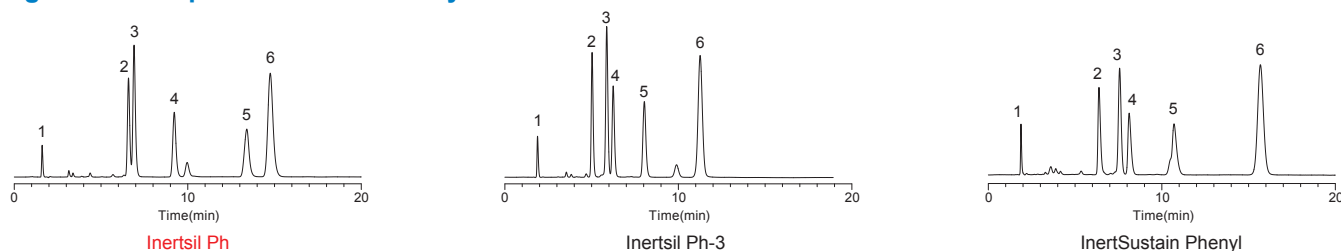
Inertsil Ph

- **Silica** : 2 Series High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 320 m^2/g
- **Pore Size** : 150 Å (15 nm)
- **Pore Volume** : 1.20 mL/g
- **Functional Group** : Phenethyl
- **End-capping** : Yes
- **Carbon Loading** : 10 %
- **USP Code** : L11
- **pH Range** : 2 - 7



Inertsil Ph has phenethyl groups bonded to silica gel which offers weak pi-pi interactions. As it is modified with phenethyl groups, hydrophobic interactions between alkyl chain and analytes play an important role in separation as well as π - π interactions. To change the selectivity or elution pattern drastically, InertSustain Phenyl is recommended as it provides strong pi-pi interactions, resulting in resolving compounds that could not be separated on a C18 or C8 phase.

Figure 1 : Comparison of Selectivity



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.

Eluent : A) CH_3OH

B) H_2O

A/B = 60/40, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 $^\circ\text{C}$

Detection : UV 254 nm

Sample :

1. Uracil

2. Ethylbenzene

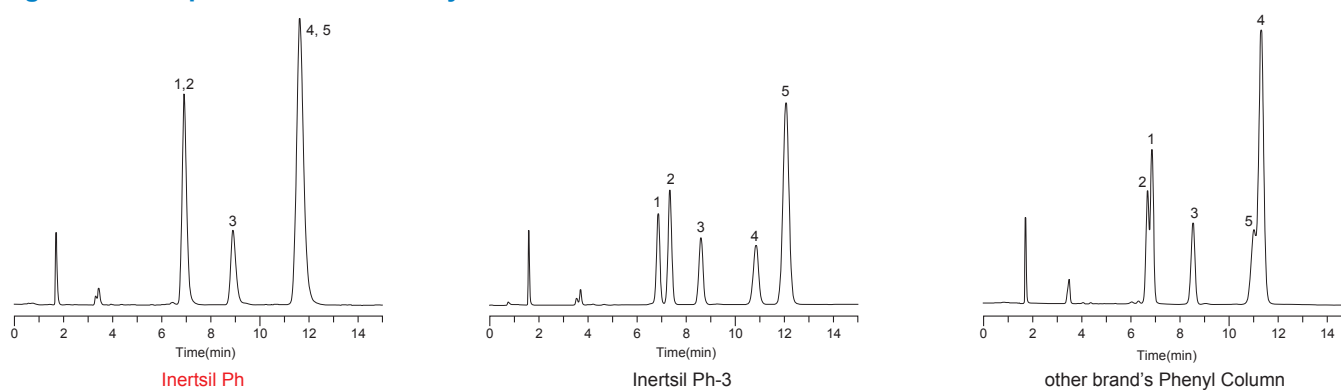
3. Naphthalene

4. Propylbenzene

5. Butylbenzene

6. Anthracene

Figure 2 : Comparison of Selectivity



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.

Eluent : A) CH_3CN

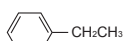
B) H_2O

A/B = 50/50, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 $^\circ\text{C}$

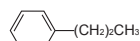
Detection : UV 254 nm



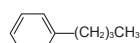
1. Ethylbenzene



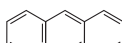
2. Naphthalene



3. n-Propylbenzene



4. n-Butylbenzene



5. Anthracene

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01321	5020-01322	5020-01323	5020-01324
	250	5020-01325	5020-01326	5020-01327	5020-01328

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19137	5020-19187
4.0, 4.6		4.0	5020-19037	5020-19087
2.1, 3.0	20	3.0	5020-19537	5020-19587
4.0, 4.6		4.0	5020-19437	5020-19487
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550



Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain Cyano

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 350 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Cyanopropyl
- **End-capping** : Yes
- **Carbon Loading** : 8%
- **USP Code** : L10
- **pH Range** : 2 - 7.5

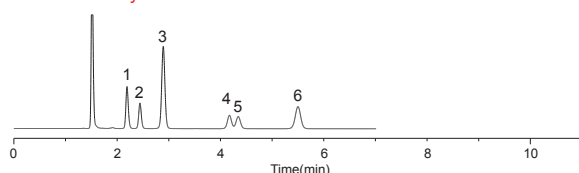


In general, the stability and reproducibility of the Cyano phase available in the market are poor. Many batch-to-batch or lot-to-lot reproducibility issues are occurring at many laboratories. The InertSustain Cyano columns were developed to resolve these problems and are designed using the most modern LC column technology available providing them to be extremely inert, stable and reproducible.

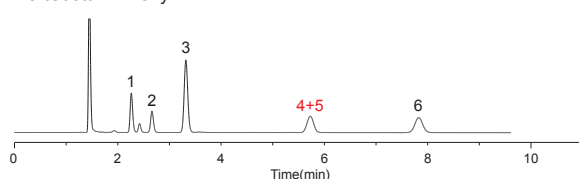
The InertSustain Cyano columns are highly recommended for all pharmacopeia methods requiring a Cyano phase to be used. (Ex: USP L10)

Figure 1 : Comparison of Selectivity

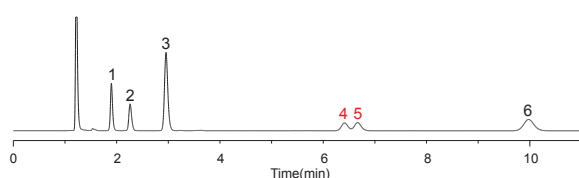
InertSustain Cyano



InertSustain Phenyl



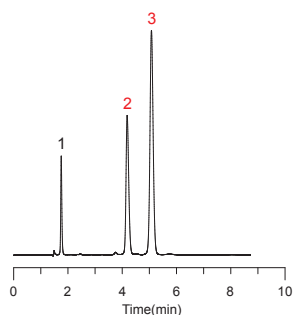
InertSustain C18



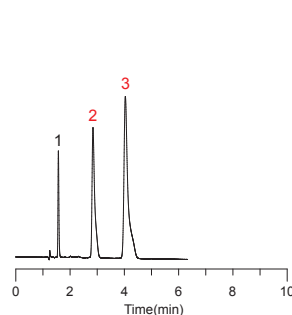
Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN B) 0.1% H_3PO_4
 A/B = 25/75, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 280 nm
 Sample : 1. 4-Hydroxybenzamide
 2. Hydroquinone
 3. 4-Hydroxybenzoic acid
 4. Phenol
 5. 4-Hydroxybenzonitril
 6. *p*-Nitrophenol

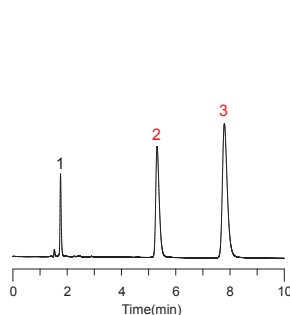
Figure 2 : Comparison of Basic Compounds Analysis



InertSustain Cyano



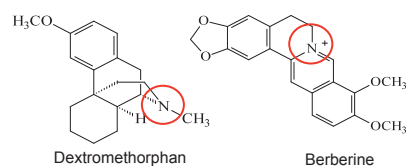
ZORBAX SB-CN



XSelect HSS CN

Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN B) 0.1% H_3PO_4
 A/B = 25/75, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 230 nm
 Sample : 1. Uracil
 2. Dextromethorphan
 3. Berberine



Analytical Columns

HP Series Particle Size: 3 μm 50 MPa (500 bar)	Length \ I.D. (mm)	2.1	3.0	4.6	
	30	5020-89459	5020-89465	5020-89471	
	50	5020-89460	5020-89466	5020-89472	
	75	5020-89461	5020-89467	5020-89473	
	100	5020-89462	5020-89468	5020-89474	
	150	5020-89463	5020-89469	5020-89475	
	250	5020-89464	5020-89470	5020-89476	
Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89410	5020-89416		
	50	5020-89411	5020-89417		
	75	5020-89412	5020-89418		
	100	5020-89413	5020-89419		
	150	5020-89414	5020-89420		
	250	5020-89415	5020-89421		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89374	5020-89381	5020-89388	5020-89395
	50	5020-89375	5020-89382	5020-89389	5020-89396
	75	5020-89376	5020-89383	5020-89390	5020-89397
	100	5020-89377	5020-89384	5020-89391	5020-89398
	150	5020-89378	5020-89385	5020-89392	5020-89399
	250	5020-89379	5020-89386	5020-89393	5020-89400
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89288	5020-89294		
	50	5020-89289	5020-89295		
	75	5020-89290	5020-89296		
	100	5020-89291	5020-89297		
	150	5020-89292	5020-89298		
	250	5020-89293	5020-89299		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89251	5020-89258	5020-89265	5020-89272
	50	5020-89252	5020-89259	5020-89266	5020-89273
	75	5020-89253	5020-89260	5020-89267	5020-89274
	100	5020-89254	5020-89261	5020-89268	5020-89275
	150	5020-89255	5020-89262	5020-89269	5020-89276
	250	5020-89256	5020-89263	5020-89270	5020-89277

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-89449	5020-89355	5020-89450	5020-89356
1.5, 2.1		1.5	5020-89451	5020-89357	5020-89452	5020-89358
2.1, 3.0		3.0	5020-89447	5020-89353	5020-89448	5020-89354
4.0, 4.6		4.0	5020-89445	5020-89351	5020-89446	5020-89352
2.1, 3.0	20	3.0	5020-89455	5020-89361	5020-89456	5020-89362
4.0, 4.6		4.0	5020-89453	5020-89359	5020-89454	5020-89360
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil WP300 C18

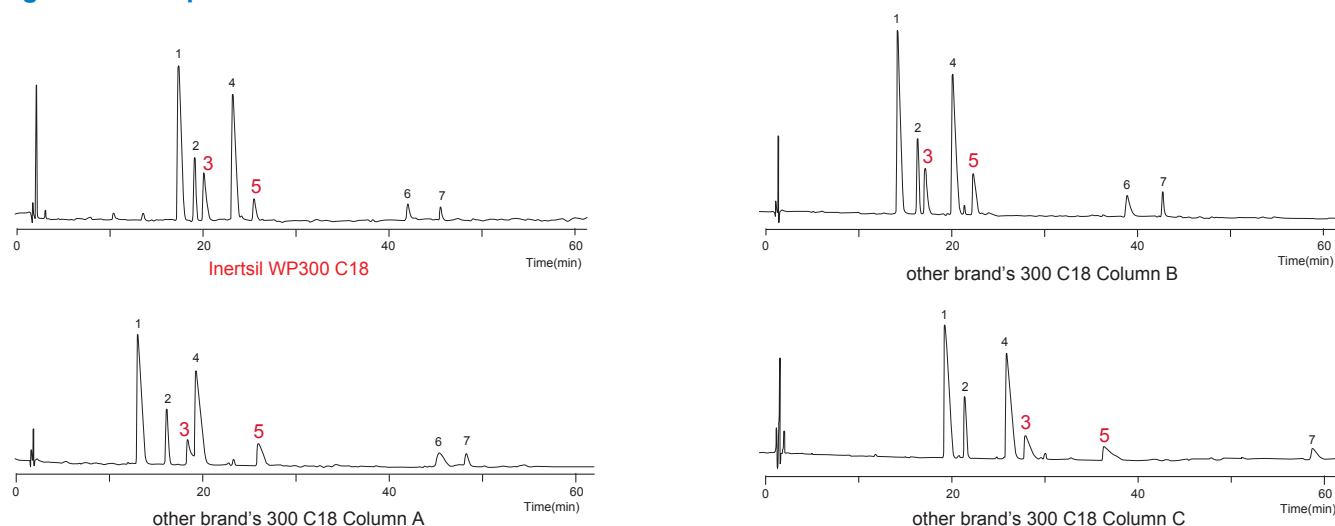
- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 150 m²/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octadecyl
- End-capping : Yes
- Carbon Loading : 9 %
- USP Code : L1
- pH Range : 2 - 7.5



Inertsil WP300 C18 (wide pore size of 300 Å) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible separations of proteins and peptides.

The results of GL Sciences' original end-capping technique are shown in Figure 1, which provide high efficiency and good peak shape for proteins and peptides.

Figure 1 : Comparison with Other Brands



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.

Eluent : A) 0.05 % HCOOH in (CH₃CN/H₂O = 90/10, v/v)

B) 0.05 % HCOOH in H₂O

A/B = 10/90 – 60 min – 40/60, v/v

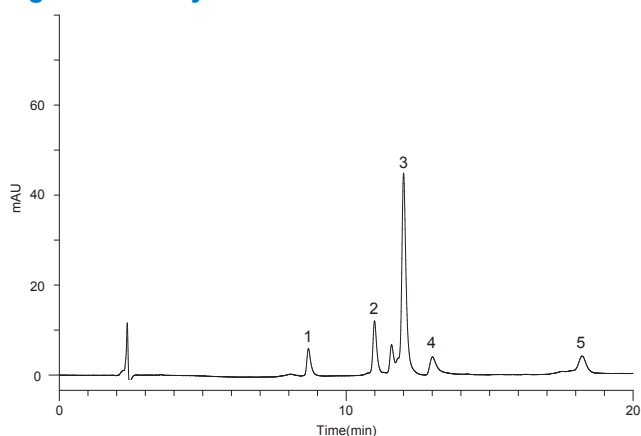
Flow Rate : 2.0 mL/min

Col. Temp. : 30 °C

Detection : UV 254 nm

Sample : 1. Methionine Enkephalin (Tyr-Gly-Gly-Phe-Met, MW 574)
 2. Oxytocin (Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-Gly-NH₂, MW 1,007)
 3. Angiotensin II (Asp-Arg-Val-Tyr-Ile-His-Pro-Phe, MW 1,032)
 4. Leucin Enkephalin (Tyr-Gly-Gly-Phe-Leu, MW 556)
 5. Angiotensin I (Asp-Arg-Val-Tyr-Ile-His-Pro-Phe-His-Leu, MW 1,297)
 6. Insulin (MW 6,000)
 7. Insulin Chain B (MW 3,496)

Figure 2 : Analysis of Proteins



Conditions

Column : Inertsil WP300 C18 (5 µm, 150 × 3.0 mm I.D.)

Eluent : A) 0.1 % TFA in CH₃CN

B) 0.1 % TFA in H₂O

A/B = 20/80 – 20 min – 70/30, v/v

Flow Rate : 0.4 mL/min

Col. Temp. : 40 °C

Detection : UV 280 nm

Injection Vol. : 10 µL

Sample : 1. Ribonuclease B

2. Cytochrome C

3. Lysozyme

4. BSA

5. Ovalbumin

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.6	
	50	5020-41100	5020-	5020-41103	
	150	5020-41101	5020-41102	5020-41104	
	250	5020-	5020-	5020-41105	
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85811	5020-85821		
	50	5020-85812	5020-85822		
	75	5020-85813	5020-85823		
	100	5020-85814	5020-85824		
	150	5020-85815	5020-85825		
	250	5020-85816	5020-85826		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05811	5020-05821	5020-05831	5020-05841
	50	5020-05812	5020-05822	5020-05832	5020-05842
	75	5020-05813	5020-05823	5020-05833	5020-05843
	100	5020-05814	5020-05824	5020-05834	5020-05844
	150	5020-05815	5020-05825	5020-05835	5020-05845
	250	5020-05816	5020-05826	5020-05836	5020-05846

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19228	5020-19278
1.5, 2.1		1.5	5020-19328	5020-19378
2.1, 3.0		3.0	5020-19128	5020-19178
4.0, 4.6		4.0	5020-19028	5020-19078
2.1, 3.0	20	3.0	5020-19528	5020-19578
4.0, 4.6		4.0	5020-19428	5020-19478
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil WP300 C8

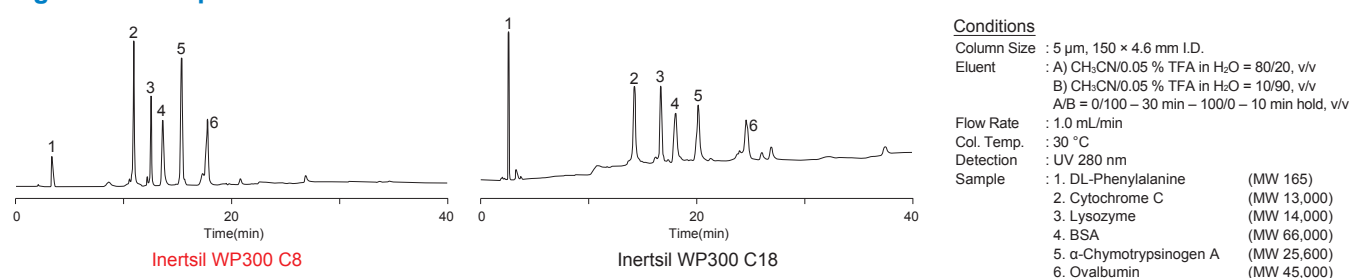
- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 150 m^2/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Octcyl
- End-capping : Yes
- Carbon Loading : 4 %
- USP Code : L7
- pH Range : 2 - 7.5



Inertsil WP300 C8 (wide pore size of 300 Å) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible rapid separations of proteins and peptides.

As shown in Figure 1, Inertsil WP300 C8 delivers rapid analysis with sharper peaks compared to Inertsil WP300 C18.

Figure 1 : Comparison with Inertsil WP300 C18



Analytical Columns

Particle Size: 5 μm	Length \ I.D. (mm)	1.0		1.5	
	33	5020-85711		5020-85721	
	50	5020-85712		5020-85722	
	75	5020-85713		5020-85723	
	100	5020-85714		5020-85724	
	150	5020-85715		5020-85725	
	250	5020-85716		5020-85726	
	Length \ I.D. (mm)	2.1		3.0	
	33	5020-05711		5020-05721	
	50	5020-05712		5020-05722	
	75	5020-05713		5020-05723	
	100	5020-05714		5020-05724	
	150	5020-05715		5020-05725	
	250	5020-05716		5020-05726	
	Length \ I.D. (mm)	4.0		4.6	
	33	5020-05731		5020-05741	
	50	5020-05732		5020-05742	
	75	5020-05733		5020-05743	
	100	5020-05734		5020-05744	
	150	5020-05735		5020-05745	
	250	5020-05736		5020-05746	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 μm	5 μm
1.0	10	1.0	5020-19229	5020-19279
1.5, 2.1		1.5	5020-19329	5020-19379
2.1, 3.0		3.0	5020-19129	5020-19179
4.0, 4.6		4.0	5020-19029	5020-19079
2.1, 3.0	20	3.0	5020-19529	5020-19579
4.0, 4.6		4.0	5020-19429	5020-19479
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

Inertsil WP300 C4

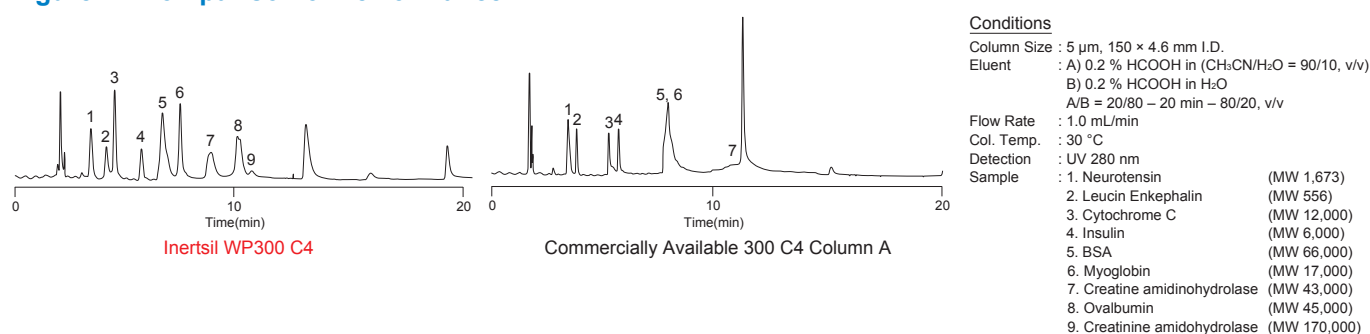
- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 150 m²/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Butyl
- End-capping : No
- Carbon Loading : 3 %
- USP Code : L26
- pH Range : 2 - 7.5



PG : Polar Group

Inertsil WP300 C4 is a butyl group bonded phase utilizing silica gel with wide pores (300 Å). Also, an optimal polar group is embedded between silica surface and butyl group, which reduces adsorption of basic compounds and fat-soluble proteins. Inertsil WP300 C4 is recommended for the analysis of large, highly fat-soluble proteins and peptides as illustrated in Figure 1.

Figure 1 : Comparison of Performance



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0		1.5	
	33	5020-86111		5020-86121	
	50	5020-86112		5020-86122	
	75	5020-86113		5020-86123	
	100	5020-86114		5020-86124	
	150	5020-86115		5020-86125	
	250	5020-86116		5020-86126	
	Length \ I.D. (mm)	2.1		3.0	
	33	5020-05861		5020-05871	
	50	5020-05862		5020-05872	
	Length \ I.D. (mm)	4.0		4.6	
	33	5020-05881		5020-05891	
	50	5020-05882		5020-05892	
	75	5020-05883		5020-05893	
	100	5020-05884		5020-05894	
	150	5020-05885		5020-05895	
	250	5020-05886		5020-05896	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19230	5020-19280
1.5, 2.1		1.5	5020-19330	5020-19380
2.1, 3.0		3.0	5020-19130	5020-19180
4.0, 4.6		4.0	5020-19030	5020-19080
2.1, 3.0	20	3.0	5020-19530	5020-19580
4.0, 4.6		4.0	5020-19430	5020-19480
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550



HILIC Columns

• About HILIC Columns	056
• InertSustain Amide	058
• Inertsil Amide	060
• Inertsil HILIC	062
• InertSustain NH2	064
• Inertsil NH2.....	066

About HILIC Columns

HILIC is, abbreviated name for Hydrophilic Interaction Chromatography, and it was developed as an alternative to reversed phase chromatography for highly polar compounds (Figure1). Inertsil HILIC is the column which chemically bonded with diol group, and it provides excellent peak shape for neutral and basic compounds. In HILIC mode, generally when organic concentration is raised, it shows a strong retention (Figure 2). Moreover, it can get more stable analysis by adding basic solvent to the eluate, such as ammonium acetate.

Figure 1 : Separation Mode from Reversed Phase to HILIC

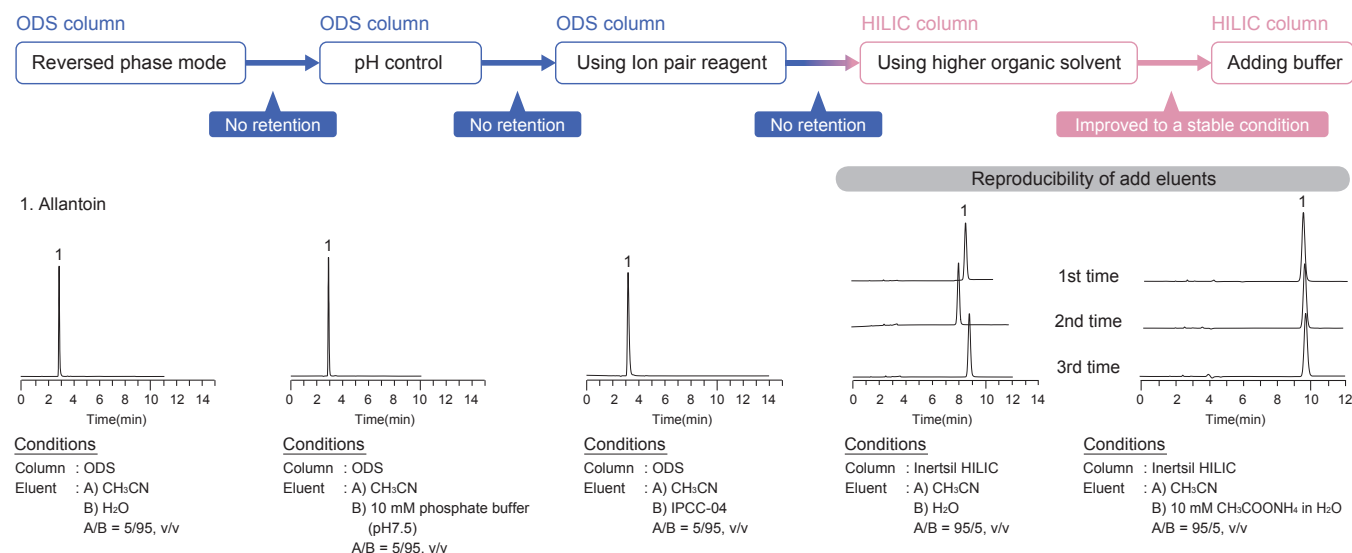
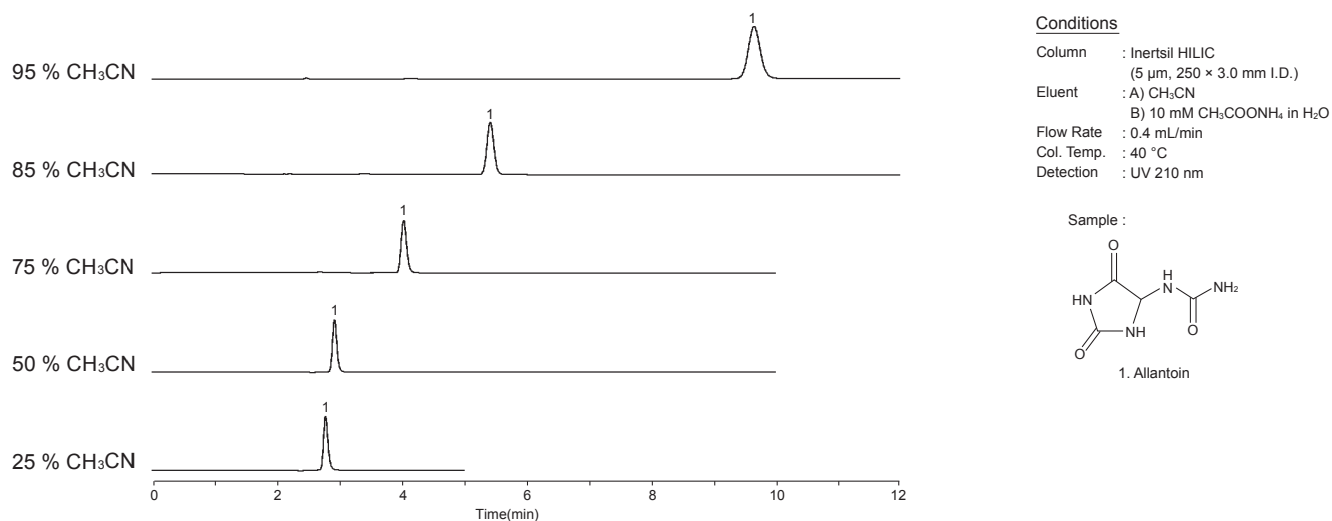


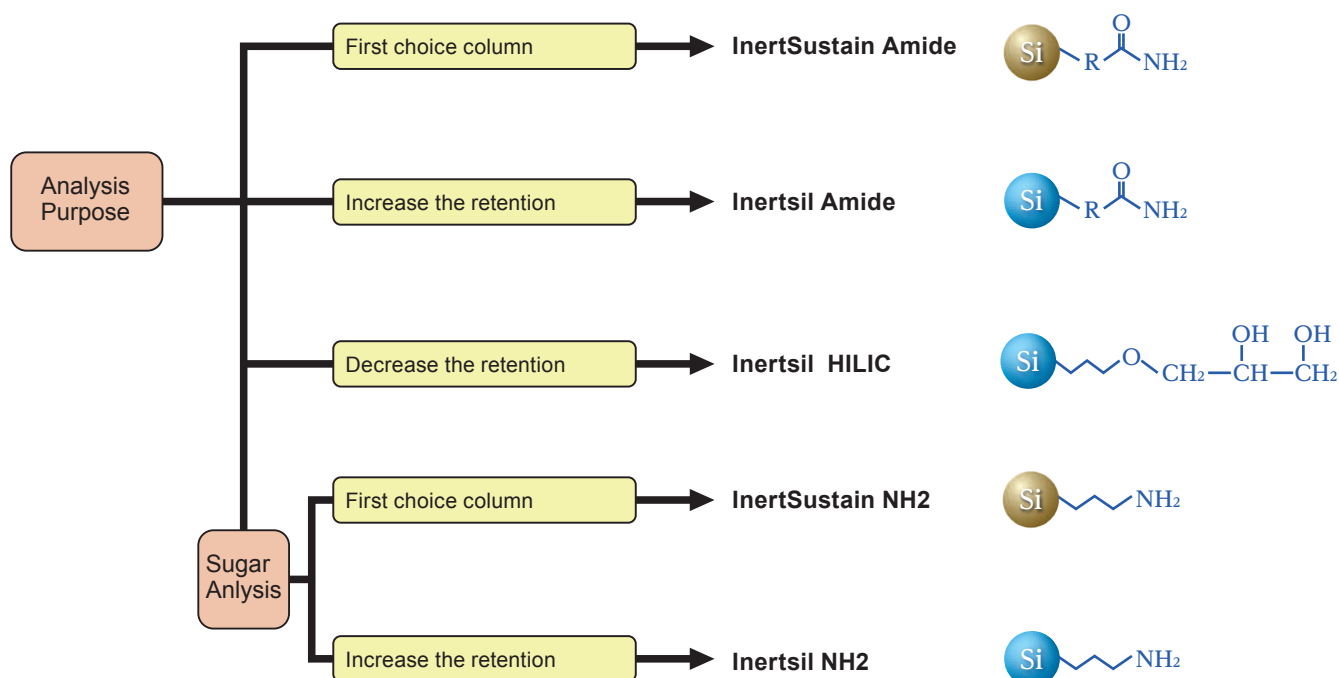
Figure 2 : Correlation between Retention Time and the Concentration of CH₃CN in Mobile Phase



HILIC Column Specification

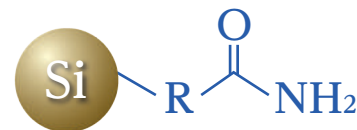
Columns	Features	Particle Size (μm)	Pore Size (nm)	Surface Area (m ² /g)	Carbon Loading (%)	Recommended pH range
InertSustain Amide	First choice column for HILIC mode.	3, 5	10	350	15	2 - 8.5
Inertsil Amide	Effective when the retention of high polar components is further strengthened.	3, 5	10	450	18	2 - 7.5
Inertsil HILIC	Effective when the overall retention is to be reduced or when the separation pattern is to be changed.	3, 5	10	450	20	2 - 7.5
InertSustain NH2	First choice column for sugar analysis.	3, 5	10	350	7	2 - 7.5
Inertsil NH2	Effective for intensifying retention in sugar analysis.	3, 5	10	450	8	2 - 7.5

HILIC Column Selection



InertSustain Amide

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 350 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Carbamoyl
- **End-capping** : No
- **Carbon Loading** : 15 %
- **USP Code** : L68
- **pH Range** : 2 - 8.5

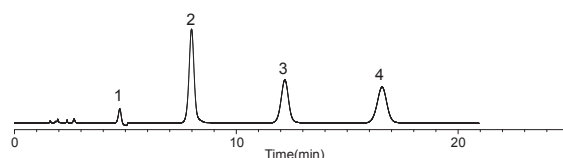


InertSustain Amide column is a HILIC (Hydrophilic Interaction Chromatography) column for enhanced retention of extremely polar compounds. It offers the strongest retentivity among the Amide columns available in the market due to the usage and bonding of carbamoyl groups. Superior stability and durability even under water rich mobile phases.

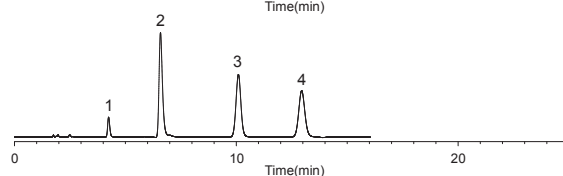
Comparison with Other Brands

HILIC phases are particularly useful for compounds that are weakly retained by reversed phase columns such as Melamine and Cyanuric Acid. As shown below, InertSustain Amide provides stronger retention for such analytes compared to other HILIC columns available in the market.

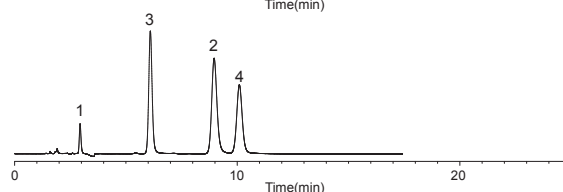
**InertSustain Amide
(Amide)**



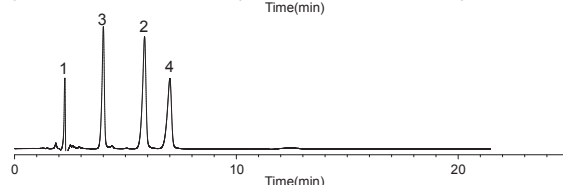
**TSKgel Amide-80
(Amide)**



**XBridge BEH Amide
(Amide)**



**Atlantis Silica HILIC
(Unbonded Silica)**



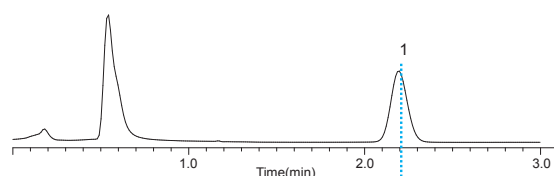
Conditions

Column	: 5 μm , 150 $\times$ 2.1 mm I.D
Eluent	: A) CH_3CN B) 10 mM HCOONH_4 in H_2O A/B = 90/10, v/v
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 $^\circ\text{C}$
Detection	: UV 215 nm
Sample	: 1. Cyanuric Acid 2. Melamine 3. Ammelide 4. Ammeline

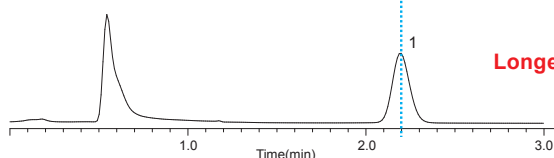
Extreme Durability

The use of metaphosphoric acid aqueous solution as a diluent solvent is a common technique to prevent the decomposition of sample in Vitamin C (ascorbic acid) analysis. A silica-base amide type columns often show short column lifetime due to the usage of strongly acidic diluent solvent in the analysis. As proven below, InertSustain Amide offer longer column lifetime even under such harsh analytical condition.

1st Injection



**After 1,000
Injections**



Longer Column Lifetime

Conditions

Column	: InertSustain Amide (5 μm , 150 $\times$ 3.0 mm I.D)
Eluent	: A) CH_3CN B) 0.1% H_3PO_4 in H_2O A/B = 87/13, v/v
Flow Rate	: 0.8 mL / min
Col. Temp.	: 40 $^\circ\text{C}$
Detection	: UV 243 nm
Injection Vol.	: 2 μL
Sample	: 1. Ascorbic acid
Diluent	: 2 % metaphosphoric acid aqueous solution

Analytical Columns

Particle Size: 3 µm	Length\I.D. (mm)	1.0	1.5		
	30	5020-88766	5020-88772		
	50	5020-88767	5020-88773		
	75	5020-88768	5020-88774		
	100	5020-88769	5020-88775		
	150	5020-88770	5020-88776		
	250	5020-88771	5020-88777		
	Length\I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88726	5020-88734	5020-88742	5020-88750
	50	5020-88727	5020-88735	5020-88743	5020-88751
	75	5020-88728	5020-88736	5020-88744	5020-88752
	100	5020-88729	5020-88737	5020-88745	5020-88753
	125	5020-88730	5020-88738	5020-88746	5020-88754
	150	5020-88731	5020-88739	5020-88747	5020-88755
	250	5020-88732	5020-88740	5020-88748	5020-88756
Particle Size: 5 µm	Length\I.D. (mm)	1.0	1.5		
	30	5020-88642	5020-88648		
	50	5020-88643	5020-88649		
	75	5020-88644	5020-88650		
	100	5020-88645	5020-88651		
	150	5020-88646	5020-88652		
	250	5020-88647	5020-88653		
	Length\I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88602	5020-88610	5020-88618	5020-88626
	50	5020-88603	5020-88611	5020-88619	5020-88627
	75	5020-88604	5020-88612	5020-88620	5020-88628
	100	5020-88605	5020-88613	5020-88621	5020-88629
	125	5020-88606	5020-88614	5020-88622	5020-88630
	150	5020-88607	5020-88615	5020-88623	5020-88631
	250	5020-88608	5020-88616	5020-88624	5020-88632

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-88805	5020-88709	5020-88806	5020-88710
1.5, 2.1		1.5	5020-88807	5020-88711	5020-88808	5020-88712
2.1, 3.0		3.0	5020-88803	5020-88707	5020-88804	5020-88708
4.0, 4.6		4.0	5020-88801	5020-88705	5020-88802	5020-88706
2.1, 3.0	20	3.0	5020-88811	5020-88715	5020-88812	5020-88716
4.0, 4.6		4.0	5020-88809	5020-88713	5020-88810	5020-88714
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Special Columns

Guard Columns

Preparative Columns

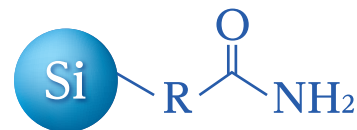
Capillary Columns

Applications

Cat. No. Index

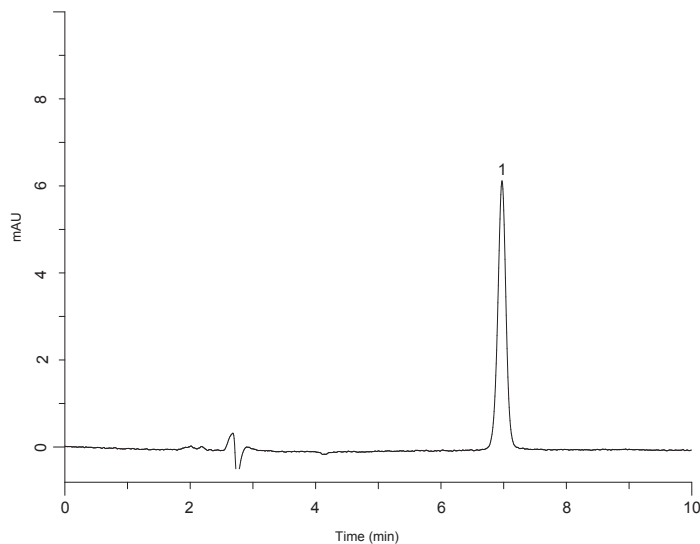
Inertsil Amide

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Carbamoyl
- **End-capping** : No
- **Carbon Loading** : 18 %
- **USP Code** : L68
- **pH Range** : 2 - 7.5
- **Usable organic solvents concentration**: 50 % or more.



Inertsil Amide column is bonded of carbamoyl group, and it shows strong retention of highly polar compounds. As shown below, compared to other commercial columns, Inertsil Amide showed high retentivity. Inertsil Amide provides excellent performance for those hard to retain compounds using an ODS column with a long lifetime.

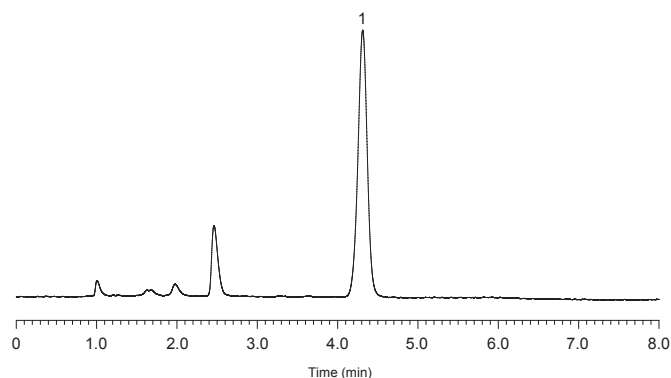
Figure 1 : Oxalic Acid



Conditions

Column Size : 5 μm , 250 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN
 B) 30 mM Na_2HPO_4 in H_2O (pH 6.8)
 A/B = 65/35, v/v
 Flow Rate : 1 mL/min
 Col. Temp. : 50 $^\circ\text{C}$
 Detection : UV 220 nm (GL-7450 UV Detector)
 Injection Vol. : 5 μL
 Sample : Oxalic acid (100 mg/L)

Figure 2 : Urea



Conditions

Column Size : 5 μm , 150 $\times$ 3.0 mm I.D.
 Eluent : A) CH_3CN
 B) H_2O
 A/B = 85/15, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 200 nm
 Injection Vol. : 5.0 μL
 Sample : Urea (200 mg/L)

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86831	5020-86841		
	50	5020-86832	5020-86842		
	75	5020-86833	5020-86843		
	100	5020-86834	5020-86844		
	150	5020-86835	5020-86845		
	250	5020-86836	5020-86846		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07861	5020-07871	5020-07881	5020-07891
	50	5020-07862	5020-07872	5020-07882	5020-07892
	75	5020-07863	5020-07873	5020-07883	5020-07893
	100	5020-07864	5020-07874	5020-07884	5020-07894
	150	5020-07865	5020-07875	5020-07885	5020-07895
	250	5020-07866	5020-07876	5020-07886	5020-07896
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86811	5020-86821		
	50	5020-86812	5020-86822		
	75	5020-86813	5020-86823		
	100	5020-86814	5020-86824		
	150	5020-86815	5020-86825		
	250	5020-86816	5020-86826		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07801	5020-07811	5020-07821	5020-07831
	50	5020-07802	5020-07812	5020-07822	5020-07832
	75	5020-07803	5020-07813	5020-07823	5020-07833
	100	5020-07804	5020-07814	5020-07824	5020-07834
	150	5020-07805	5020-07815	5020-07825	5020-07835
	250	5020-07806	5020-07816	5020-07826	5020-07836

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-20156	5020-20155	5020-20158	5020-20157
1.5, 2.1		1.5	5020-20160	5020-20159	5020-20162	5020-20161
2.1, 3.0		3.0	5020-20152	5020-20151	5020-20154	5020-20153
4.0, 4.6		4.0	5020-20148	5020-20147	5020-20150	5020-20149
2.1, 3.0	20	3.0	5020-20168	5020-20167	5020-20170	5020-20169
4.0, 4.6		4.0	5020-20164	5020-20163	5020-20166	5020-20165
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil HILIC

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : No
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5



HILIC is, abbreviated name for Hydrophilic Interaction Chromatography, and it was developed as an alternative to reversed phase chromatography for highly polar compounds (Figure 1). Inertsil HILIC is the column which chemically bonded with diol group, and it provides excellent peak shape for neutral and basic compounds. In HILIC mode, generally when organic solvent concentration is raised, it shows a strong retention (Figure 2). Moreover, it can get more stable analysis by adding basic solvent to the eluate, such as ammonium acetate.

Figure 1 : Analysis of Taurine and Inositol

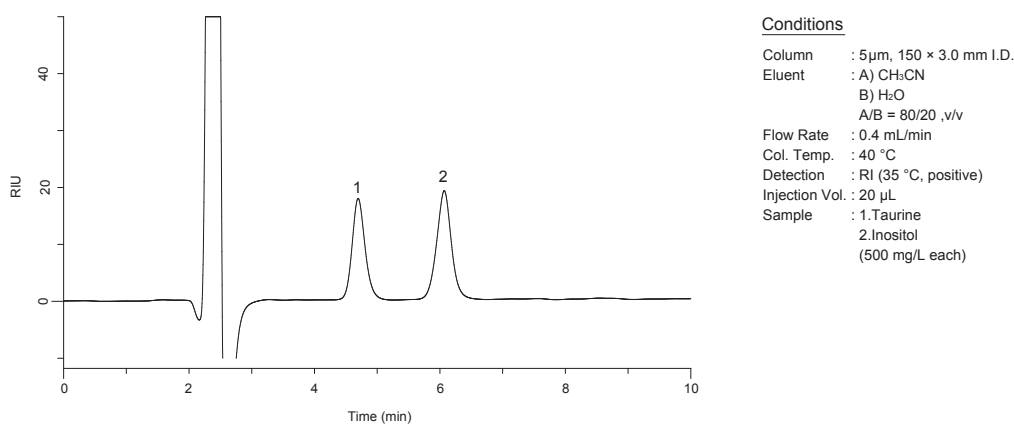
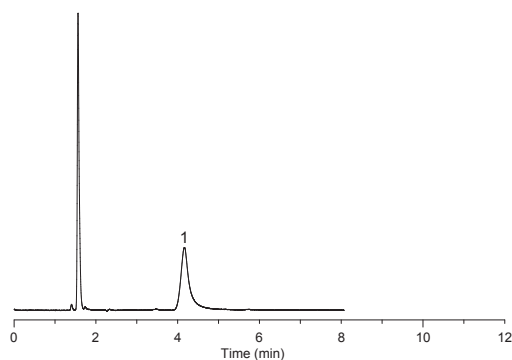


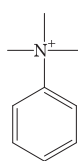
Figure 2 : Analysis of Basic Compound



Conditions

Column : 5 μm , 150 $\times$ 2.1 mm I.D.
 Eluent : A) CH_3CN B) 10 mM HCOONH_4 in H_2O
 A/B = 90/10, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm

Sample:



1. Trimethylphenylammonium

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86731	5020-86741		
	50	5020-86732	5020-86742		
	75	5020-86733	5020-86743		
	100	5020-86734	5020-86744		
	150	5020-86735	5020-86745		
	250	5020-86736	5020-86746		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07761	5020-07771	5020-07781	5020-07791
	50	5020-07762	5020-07772	5020-07782	5020-07792
	75	5020-07763	5020-07773	5020-07783	5020-07793
	100	5020-07764	5020-07774	5020-07784	5020-07794
	150	5020-07765	5020-07775	5020-07785	5020-07795
	250	5020-07766	5020-07776	5020-07786	5020-07796
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86711	5020-86721		
	50	5020-86712	5020-86722		
	75	5020-86713	5020-86723		
	100	5020-86714	5020-86724		
	150	5020-86715	5020-86725		
	250	5020-86716	5020-86726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07701	5020-07711	5020-07721	5020-07731
	50	5020-07702	5020-07712	5020-07722	5020-07732
	75	5020-07703	5020-07713	5020-07723	5020-07733
	100	5020-07704	5020-07714	5020-07724	5020-07734
	150	5020-07705	5020-07715	5020-07725	5020-07735
	250	5020-07706	5020-07716	5020-07726	5020-07736

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19225	5020-19224	5020-19275	5020-19274
1.5, 2.1		1.5	5020-19325	5020-19324	5020-19375	5020-19374
2.1, 3.0		3.0	5020-19125	5020-19124	5020-19175	5020-19174
4.0, 4.6		4.0	5020-19025	5020-19024	5020-19075	5020-19074
2.1, 3.0	20	3.0	5020-19525	5020-19524	5020-19575	5020-19574
4.0, 4.6		4.0	5020-19425	5020-19424	5020-19475	5020-19474
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain NH2

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 350 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Aminopropyl
- **End-capping** : No
- **Carbon Loading** : 7 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5



InertSustain NH2 shows far superior stability compared to other brand available aminopropyl columns, as our newly developed “Evolved Surface Silica” is chemically bonded with aminopropyl group. Generally, aminopropyl columns are used for applications that are hard to be separated in a reversed phase mode, such as simultaneous analysis of sugars or vitamin E. However, the shift in retention time has been an issue for a long time. InertSustain NH2 delivers highly reliable reproducibility and stability with accurate qualitative and quantitative results. Furthermore, aminopropyl columns generally can not be washed by weakly acidic eluent, however InertSustain NH2 was improved and it can be washed by weakly acidic eluent.

Figure 1 : Comparison of Preventing Anomer Resolution of Sugar Analysis

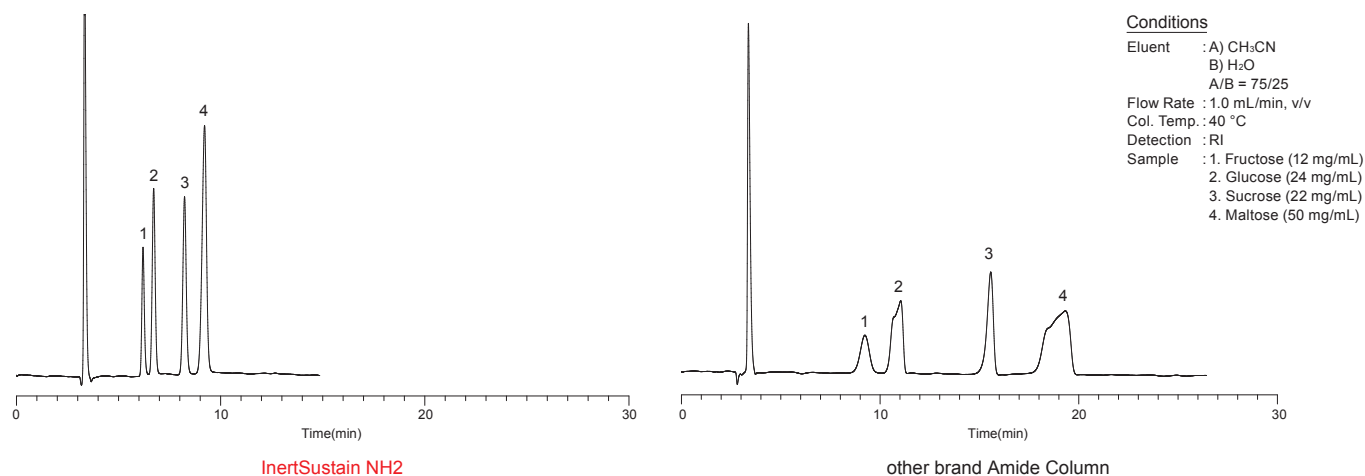


Figure 2 : Retention Change after Purged Acidic Solution

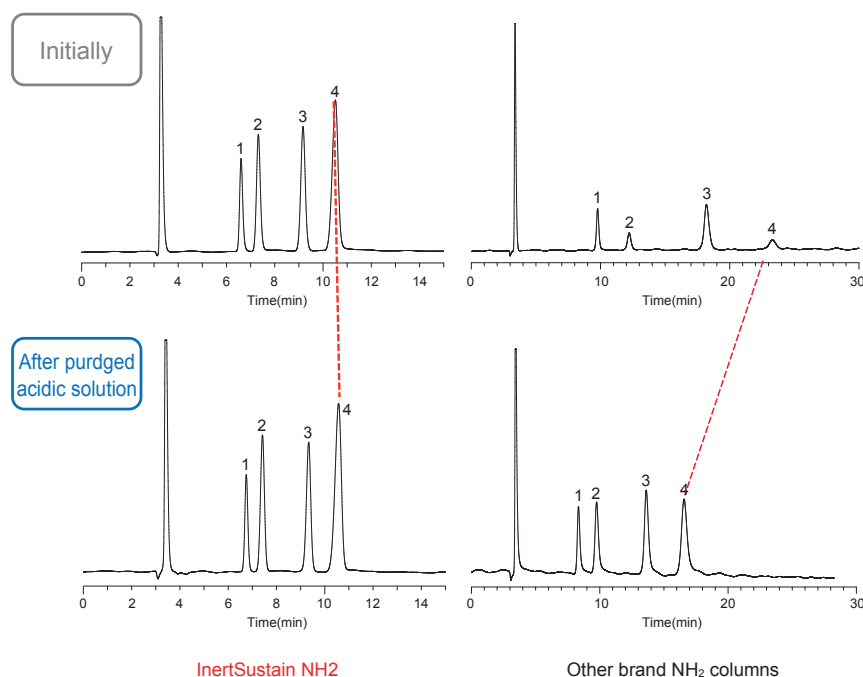
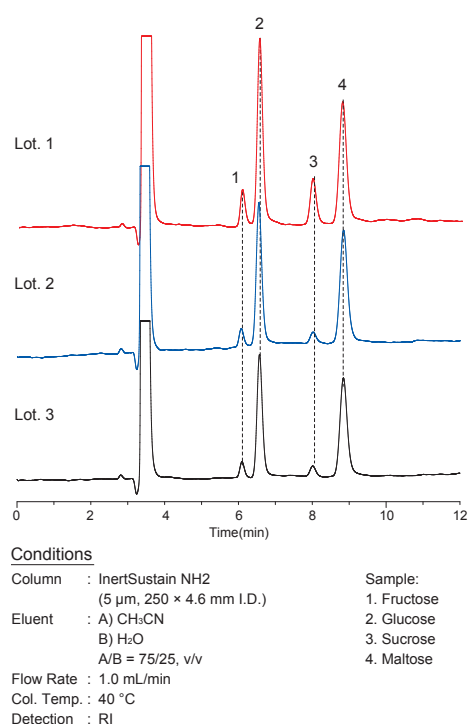


Figure 3 : Reliable Reproducibility



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16768	5020-16774		
	50	5020-16769	5020-16775		
	75	5020-16770	5020-16776		
	100	5020-16771	5020-16777		
	150	5020-16772	5020-16778		
	250	5020-16773	5020-16779		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16732	5020-16739	5020-16746	5020-16753
	50	5020-16733	5020-16740	5020-16747	5020-16754
	75	5020-16734	5020-16741	5020-16748	5020-16755
	100	5020-16735	5020-16742	5020-16749	5020-16756
	150	5020-16736	5020-16743	5020-16750	5020-16757
	250	5020-16737	5020-16744	5020-16751	5020-16758
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16639	5020-16645		
	50	5020-16640	5020-16646		
	75	5020-16641	5020-16647		
	100	5020-16642	5020-16648		
	150	5020-16643	5020-16649		
	250	5020-16644	5020-16650		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16602	5020-16609	5020-16616	5020-16623
	50	5020-16603	5020-16610	5020-16617	5020-16624
	75	5020-16604	5020-16611	5020-16618	5020-16625
	100	5020-16605	5020-16612	5020-16619	5020-16626
	150	5020-16606	5020-16613	5020-16620	5020-16627
	250	5020-16607	5020-16614	5020-16621	5020-16628

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16807	5020-16706	5020-16808	5020-16707
1.5, 2.1		1.5	5020-16809	5020-16708	5020-16810	5020-16709
2.1, 3.0		3.0	5020-16805	5020-16704	5020-16806	5020-16705
4.0, 4.6		4.0	5020-16803	5020-16702	5020-16804	5020-16703
2.1, 3.0	20	3.0	5020-16813	5020-16712	5020-16814	5020-16713
4.0, 4.6		4.0	5020-16811	5020-16710	5020-16812	5020-16711
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

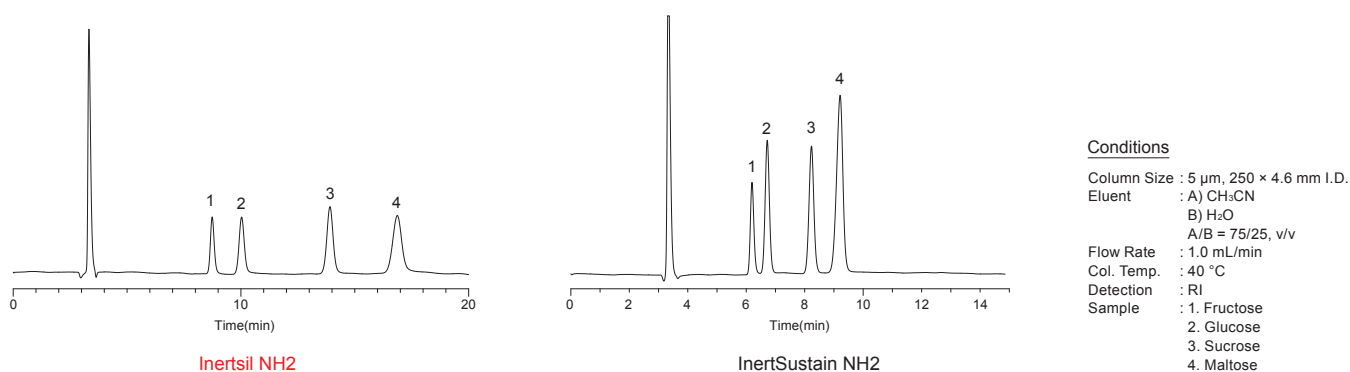
Inertsil NH2

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Aminopropyl
- **End-capping** : No
- **Carbon Loading** : 8 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5



Inertsil NH2 column is chemically bonded with Aminopropyl group. It is widely used for analyzing sugar in reversed phase mode. Compared to InertSustain NH2, InertSustain NH2 provides a better performance on durability. However, compare to other brand aminopropyl columns, Inertsil NH2 still shows excellent and strong retentivity.

Figure 1 : Comparison of Aminopropyl Columns



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85531	5020-85541		
	50	5020-85532	5020-85542		
	75	5020-85533	5020-85543		
	100	5020-85534	5020-85544		
	150	5020-85535	5020-85545		
	250	5020-85536	5020-85546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05461	5020-05471	5020-05481	5020-05491
	50	5020-05462	5020-05472	5020-05482	5020-05492
	75	5020-05463	5020-05473	5020-05483	5020-05493
	100	5020-05464	5020-05474	5020-05484	5020-05494
	150	5020-05465	5020-05475	5020-05485	5020-05495
	250	5020-05466	5020-05476	5020-05486	5020-05496
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85511	5020-85521		
	50	5020-85512	5020-85522		
	75	5020-85513	5020-85523		
	100	5020-85514	5020-85524		
	150	5020-85515	5020-85525		
	250	5020-85516	5020-85526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05511	5020-05521	5020-05531	5020-05541
	50	5020-05512	5020-05522	5020-05532	5020-05542
	75	5020-05513	5020-05523	5020-05533	5020-05543
	100	5020-05514	5020-05524	5020-05534	5020-05544
	150	5020-05515	5020-05525	5020-05535	5020-05545
	250	5020-05516	5020-05526	5020-05536	5020-05546

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19221	5020-19220	5020-19271	5020-19270
1.5, 2.1		1.5	5020-19321	5020-19320	5020-19371	5020-19370
2.1, 3.0		3.0	5020-19121	5020-19120	5020-19171	5020-19170
4.0, 4.6		4.0	5020-19021	5020-19020	5020-19071	5020-19070
2.1, 3.0	20	3.0	5020-19521	5020-19520	5020-19571	5020-19570
4.0, 4.6		4.0	5020-19421	5020-19420	5020-19471	5020-19470
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

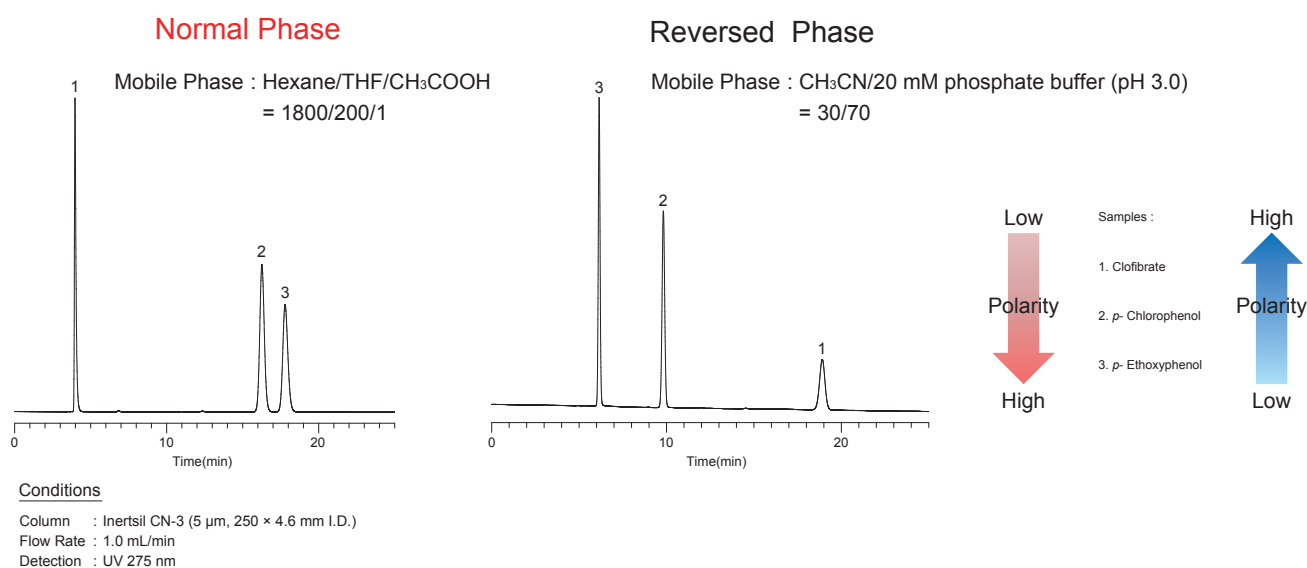


Normal Phase Columns

•About Normal Phase Columns	070
•Inertsil Diol	072
•Inertsil SIL-100A.....	074
•InertSustain NH2	076
•Inertsil NH2.....	078
•InertSustain Cyano	080
•Inertsil CN-3	082
•Inertsil SIL-150A.....	084
•Inertsil WP300 SIL	085

About Normal Phase Columns

Comparison of Reversed Phase and Normal Phase

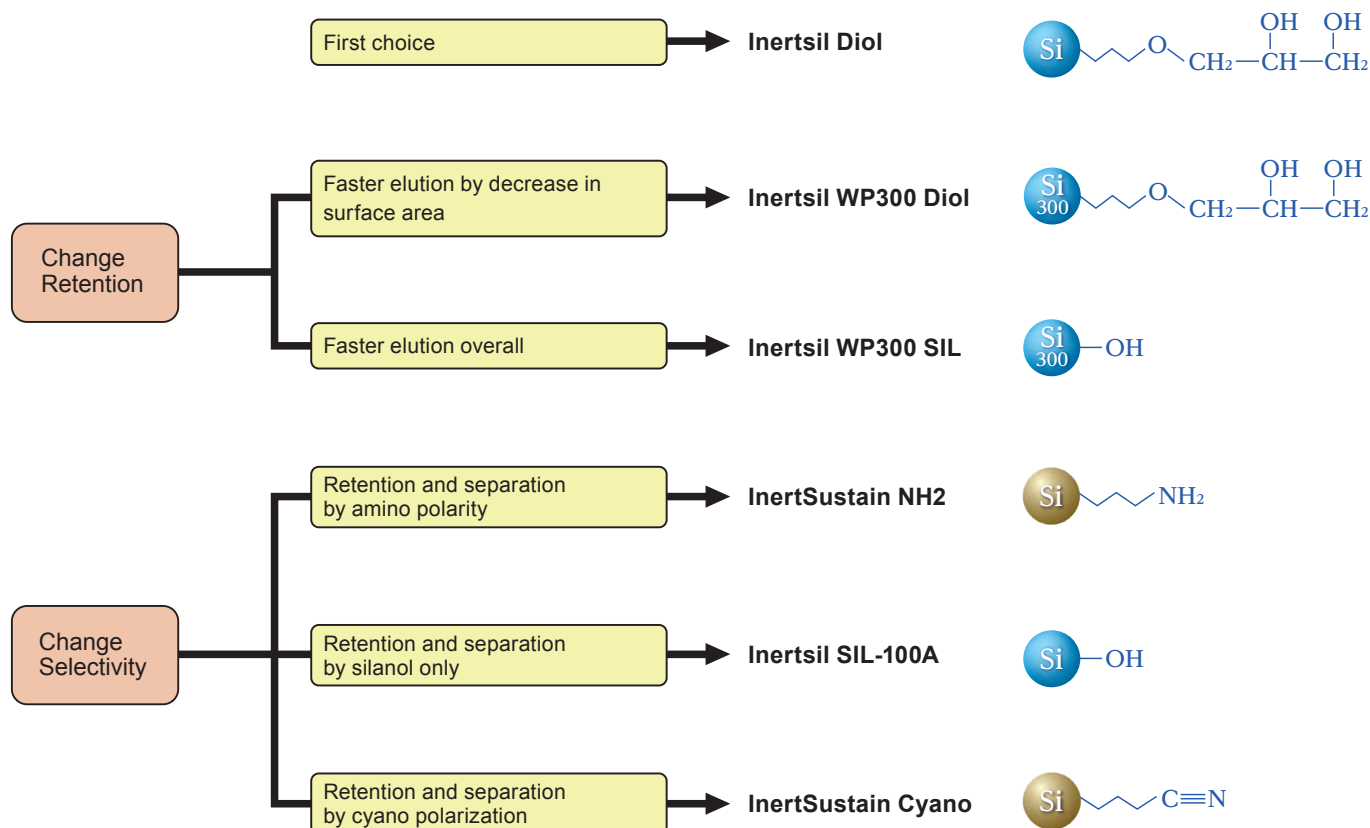


GL Sciences has Variety Normal Phase Columns, You Can Choose a Proper One for Your Applications

Column	Feature	Particle size (μm)	Pore Size (nm)	Surface area (m ² /g)	Carbon Loading (%)	Recommended operating pH range
Inertsil Diol	First choice of normal phase column (also can use as SEC)	3, 5	10	450	20	2 - 7.5
Inertsil SIL-100A	High purity silica gel column with pore size 100 Å	3, 5	10	450	—	2 - 7.5
InertSustain NH2	Weak retentivity amino column	3, 5	10	350	7	2 - 7.5
Inertsil NH2	Strong retentivity amino column	3, 5	10	450	8	2 - 7.5
InertSustain Cyano	Super inertness and also can use as a reversed phase column	3, 5	10	350	8	2 - 7.5
Inertsil CN-3	Strong retentivity cyano column	3, 5	10	450	14	2 - 7.5
Inertsil SIL-150A	High purity silica gel column with pore size 150 Å	5	15	320	—	2 - 7.5
Inertsil WP300 SIL	High purity silica gel column with pore size 300 Å	5	30	150	—	2 - 7.5

Normal Phase Column Selection Guide

Molecular Weight < 5,000 Samples on Normal Phase Mode



Solvents used in Normal Phase mode

The solvents used in normal phase mode generally combine hexane and ethanol, although in some cases, less polar solvent such like propanol or ethyl acetate also used instead of ethanol. It is necessary to select the solvent according to the retention strength of the target components.

Shipping Solvents of Normal Phase Columns

Columns	Shipping Solvents
Inertsil Diol	<i>n</i> - Hexane/Ethanol = 95/5, v/v
Inertsil SIL-100A	
Inertsil SIL-150A	
Inertsil WP300 SIL	
InertSustain NH2	<i>n</i> - Hexane/Ethanol = 98/2, v/v
Inertsil NH2	
Inertsil CN-3	
InertSustain Cyano	Acetonitrile/Water = 50/50, v/v

Inertsil Diol

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : No
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5



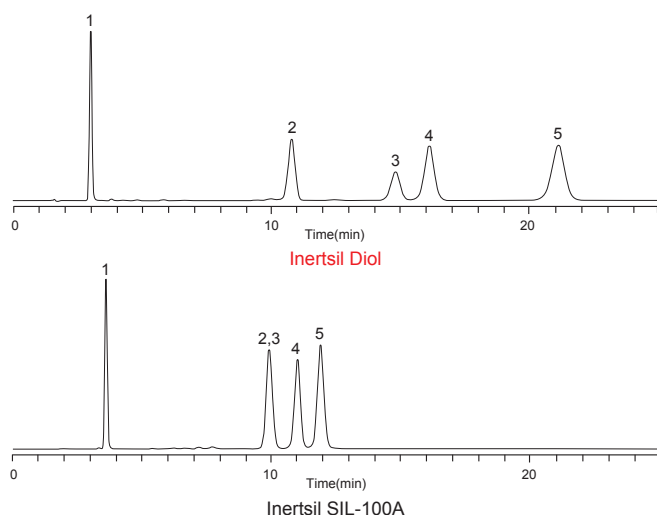
Inertsil Diol has characteristics of dihydroxypropyl group bonded phase. It shows unique selectivity normal phase mode.

The separation mechanism of diol column is featured by hydrogen bonding interactions between diol groups and polar compounds. Diol columns provide an alternative selectivity to silica columns often with increased retentivity.

Figure 1, selectivities of Inertsil Diol and Inertsil SIL-100A (a pure Silica gel column) are compared. Inertsil Diol shows higher selectivity for those compounds.

Figure 2, 9 compounds are eluted by Inertsil Diol and other normal phase columns of "Inertsil series". By comparing their retention times of each compound, it is noticeable that Inertsil Diol provides stable retention for all of the compounds, including basic and acidic compounds. As non-specific adsorption of water is reduced, Inertsil Diol can be washed by 100 % water eluent.

Figure 1 : Comparison of Selectivity between Diol Column and Silica Column



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) *n*-Hexane
 B) Ethanol
 A/B = 85/15, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : UV 254 nm

Sample :

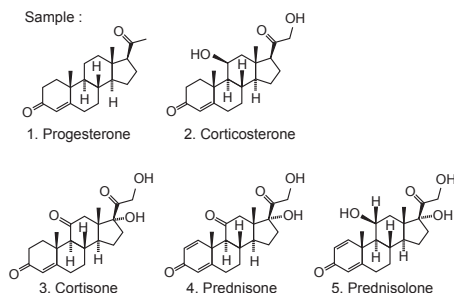
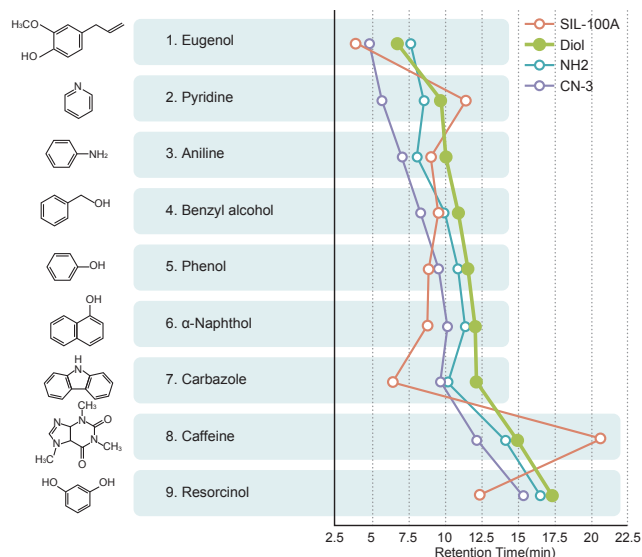
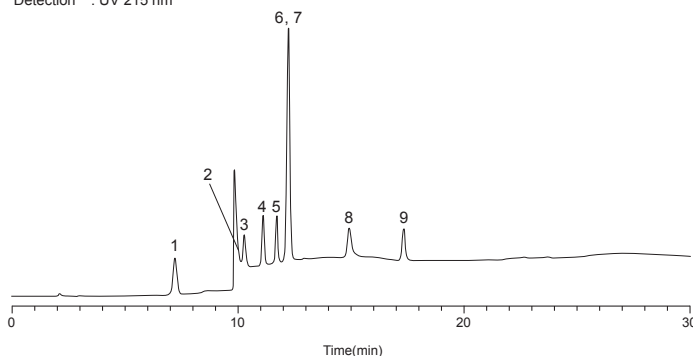


Figure 2 : Selectivity of Inertsil Diol

Conditions

Column : Inertsil Diol (5 μm , 150 $\times$ 3.0 mm I.D.)
 Eluent : A) *n*-Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 - 30 min - 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86531	5020-86541		
	50	5020-86532	5020-86542		
	75	5020-86533	5020-86543		
	100	5020-86534	5020-86544		
	150	5020-86535	5020-86545		
	250	5020-86536	5020-86546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05411	5020-05421	5020-05431	5020-05441
	50	5020-05412	5020-05422	5020-05432	5020-05442
	75	5020-05413	5020-05423	5020-05433	5020-05443
	100	5020-05414	5020-05424	5020-05434	5020-05444
	150	5020-05415	5020-05425	5020-05435	5020-05445
	250	5020-05416	5020-05426	5020-05436	5020-05446
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86511	5020-86521		
	50	5020-86512	5020-86522		
	75	5020-86513	5020-86523		
	100	5020-86514	5020-86524		
	150	5020-86515	5020-86525		
	250	5020-86516	5020-86526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05611	5020-05621	5020-05631	5020-05641
	50	5020-05612	5020-05622	5020-05632	5020-05642
	75	5020-05613	5020-05623	5020-05633	5020-05643
	100	5020-05614	5020-05624	5020-05634	5020-05644
	150	5020-05615	5020-05625	5020-05635	5020-05645
	250	5020-05616	5020-05626	5020-05636	5020-05646

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19223	5020-19222	5020-19273	5020-19272
1.5, 2.1		1.5	5020-19323	5020-19322	5020-19373	5020-19372
2.1, 3.0		3.0	5020-19123	5020-19122	5020-19173	5020-19172
4.0, 4.6		4.0	5020-19023	5020-19022	5020-19073	5020-19072
2.1, 3.0	20	3.0	5020-19523	5020-19522	5020-19573	5020-19572
4.0, 4.6		4.0	5020-19423	5020-19422	5020-19473	5020-19472
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil SIL-100A

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : None
- **End-capping** : No
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 - 7.5



Inertsil SIL-100A is a pure silica gel column available in normal phase mode. Because of the high quality of its silica gel, Inertsil SIL-100A achieves separation with sharp peaks and provides high column-to-column reproducibility. This excellent silica gel ideally designed for HPLC is the basis for "Inertsil 3-series" of GL Sciences. GL Sciences is the first company which emphasized the importance of silica-gel purity and determined the nature of the silanol impurities in the Silica gel.

GL Sciences has established a successful manufacturing process for ultra pure silica gel with smooth and rigid surface. The SEM photos of Inertsil SIL-100A and other brands' silica gel are shown as Figure 1. Particles of Inertsil SIL-100A stand out by the smooth surface, uniformity in size and spherical shape. From Figure 2, we can know as silanols on the silica surface interact with basic compounds, Inertsil SIL-100A retains basic compounds strongly and acidic compounds weakly.

Figure 1 : SEM Photos of Inertsil SIL-100A and Other Brand Available Silica Gels

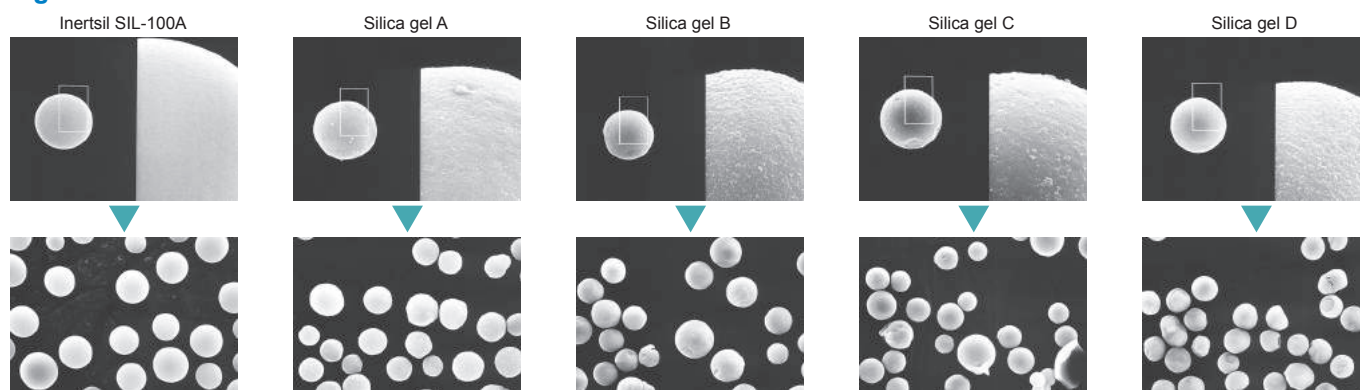
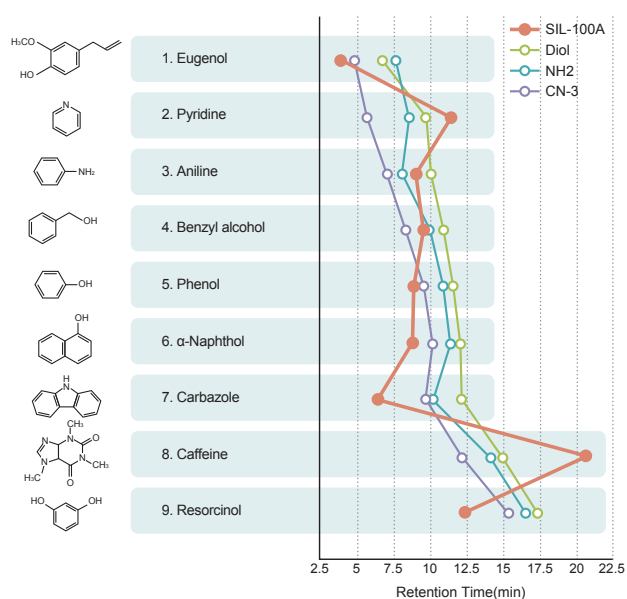
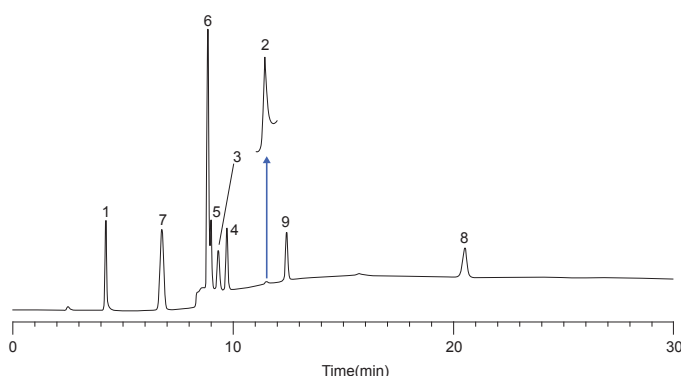


Figure 2 : Selectivity of Inertsil SIL-100A

Conditions

Column : Inertsil SIL-100A (5 μm , 150 $\times$ 3.0 mm I.D.)
 Eluent : A) *n*-Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 – 30 min – 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84211	5020-84221		
	50	5020-84212	5020-84222		
	75	5020-84213	5020-84223		
	100	5020-84214	5020-84224		
	150	5020-13422	5020-13420		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04211	5020-04221	5020-04231	5020-04241
	50	5020-04212	5020-04222	5020-04232	5020-04242
	75	5020-04213	5020-04223	5020-04233	5020-01700
	100	5020-04214	5020-04224	5020-01703	5020-04244
Particle Size: 5 µm	150	5020-04215	5020-04225	5020-04235	5020-01701
	250	5020-04216	5020-04226	5020-04236	5020-01702
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84311	5020-84321		
	50	5020-84312	5020-84322		
	75	5020-84313	5020-84323		
	100	5020-84314	5020-84324		
	150	5020-13412	5020-13410		
	250	5020-84316	5020-84326		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04311	5020-04321	5020-04331	5020-04341
	50	5020-04312	5020-04322	5020-04332	5020-04342
	75	5020-04313	5020-04323	5020-04333	5020-04343
	100	5020-04314	5020-04324	5020-04334	5020-04344
	150	5020-04315	5020-04325	5020-04335	5020-01711
	250	5020-04316	5020-04326	5020-04336	5020-01712

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19227	5020-19226	5020-19277	5020-19276
1.5, 2.1		1.5	5020-19327	5020-19326	5020-19377	5020-19376
2.1, 3.0		3.0	5020-19127	5020-19126	5020-19177	5020-19176
4.0, 4.6		4.0	5020-19027	5020-19026	5020-19077	5020-19076
2.1, 3.0	20	3.0	5020-19527	5020-19526	5020-19577	5020-19576
4.0, 4.6		4.0	5020-19427	5020-19426	5020-19477	5020-19476
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain NH2

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 350 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Aminopropyl
- **End-capping** : No
- **Carbon Loading** : 7 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5



InertSustain NH2 is a newly developed ES silica column, compare to the other normal silica columns, InertSustain NH2 performs a sharp peaks, and high reproducible results with exceptional stability and durability that will maintain performance over the lifetime of the method. Also, InertSustain NH2 is an easily equilibrate column. Figure 2 is an analysis sample to show the equilibrate time of InertSustain NH2 column. Using a column was replaced with isopropanol, phthalic acid ester as the sample and measured the time until stabilized the analysis conditions. From the chromatogram we can know at the total flow time of 21 minutes of 4th injection, the column was stabilized to be analyze.

Figure 1 : Analysis of Vitamin E with InertSustain NH2 & Inertsil NH2 Column

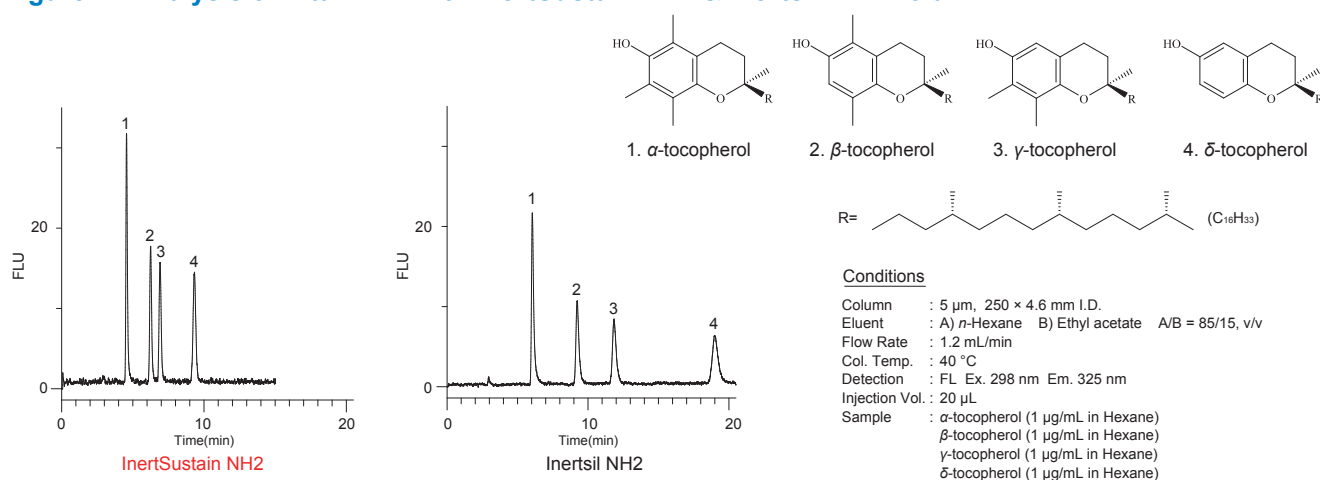
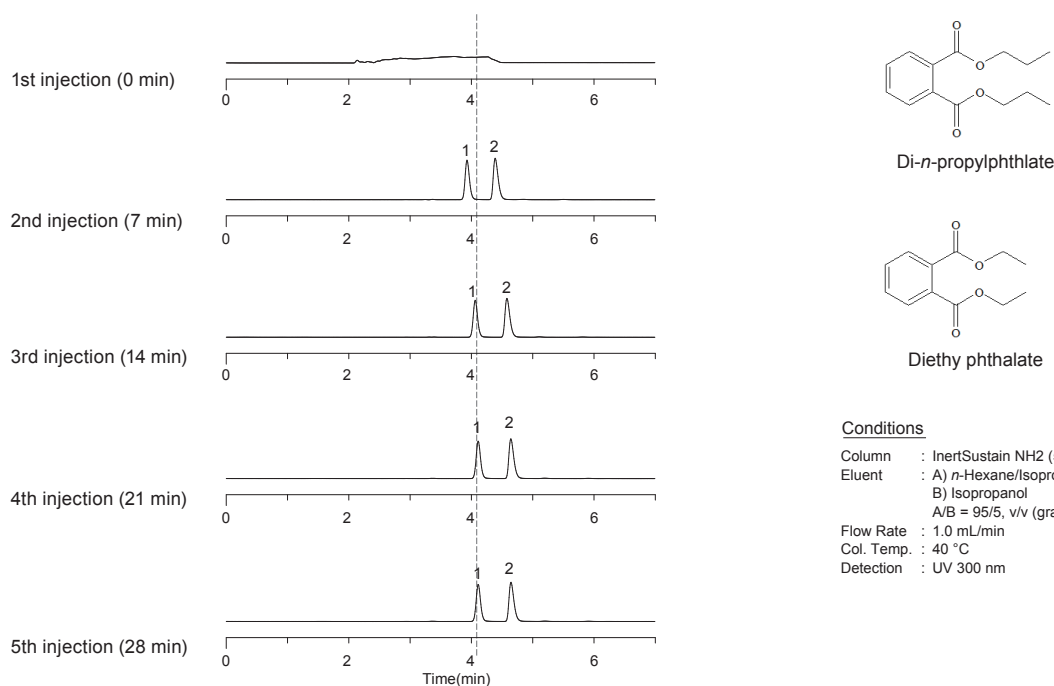


Figure 2 : Evaluation of Equilibration Time



Conditions

Column	: InertSustain NH2 (5 μm , 250 $\times$ 4.6 mm I.D.)
Eluent	: A) <i>n</i> -Hexane/Isopropanol = 100/1, v/v B) Isopropanol A/B = 95/5, v/v (gradient mixer)
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 $^{\circ}\text{C}$
Detection	: UV 300 nm

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16768	5020-16774		
	50	5020-16769	5020-16775		
	75	5020-16770	5020-16776		
	100	5020-16771	5020-16777		
	150	5020-16772	5020-16778		
	250	5020-16773	5020-16779		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16732	5020-16739	5020-16746	5020-16753
	50	5020-16733	5020-16740	5020-16747	5020-16754
	75	5020-16734	5020-16741	5020-16748	5020-16755
	100	5020-16735	5020-16742	5020-16749	5020-16756
	150	5020-16736	5020-16743	5020-16750	5020-16757
	250	5020-16737	5020-16744	5020-16751	5020-16758
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16639	5020-16645		
	50	5020-16640	5020-16646		
	75	5020-16641	5020-16647		
	100	5020-16642	5020-16648		
	150	5020-16643	5020-16649		
	250	5020-16644	5020-16650		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16602	5020-16609	5020-16616	5020-16623
	50	5020-16603	5020-16610	5020-16617	5020-16624
	75	5020-16604	5020-16611	5020-16618	5020-16625
	100	5020-16605	5020-16612	5020-16619	5020-16626
	150	5020-16606	5020-16613	5020-16620	5020-16627
	250	5020-16607	5020-16614	5020-16621	5020-16628

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16807	5020-16706	5020-16808	5020-16707
1.5, 2.1		1.5	5020-16809	5020-16708	5020-16810	5020-16709
2.1, 3.0		3.0	5020-16805	5020-16704	5020-16806	5020-16705
4.0, 4.6		4.0	5020-16803	5020-16702	5020-16804	5020-16703
2.1, 3.0	20	3.0	5020-16813	5020-16712	5020-16814	5020-16713
4.0, 4.6		4.0	5020-16811	5020-16710	5020-16812	5020-16711
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil NH2

- Base Material : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Functional Group : Aminopropyl
- End-capping : No
- Carbon Loading : 8 %
- USP Code : L8
- pH Range : 2 - 7.5



Inertsil NH2 has a wide surface area, and bonded with aminopropyl groups, an amino column performs high retention time. Inertsil NH2 achieves better separation than other commercially available amino columns as it is modified with primary amines. Figure 1 shows that Inertsil NH2 is able to separate isomers of tocopherol with good peak shape in short time compared to other commercial amino columns.

Primary Amines on the surface provides Inertsil NH2 unique selectivity as a normal phase column. Inertsil NH2 retains acidic compounds strongly and basic compound weakly (Figure 2).

Figure 1 : Analysis of Vitamin E

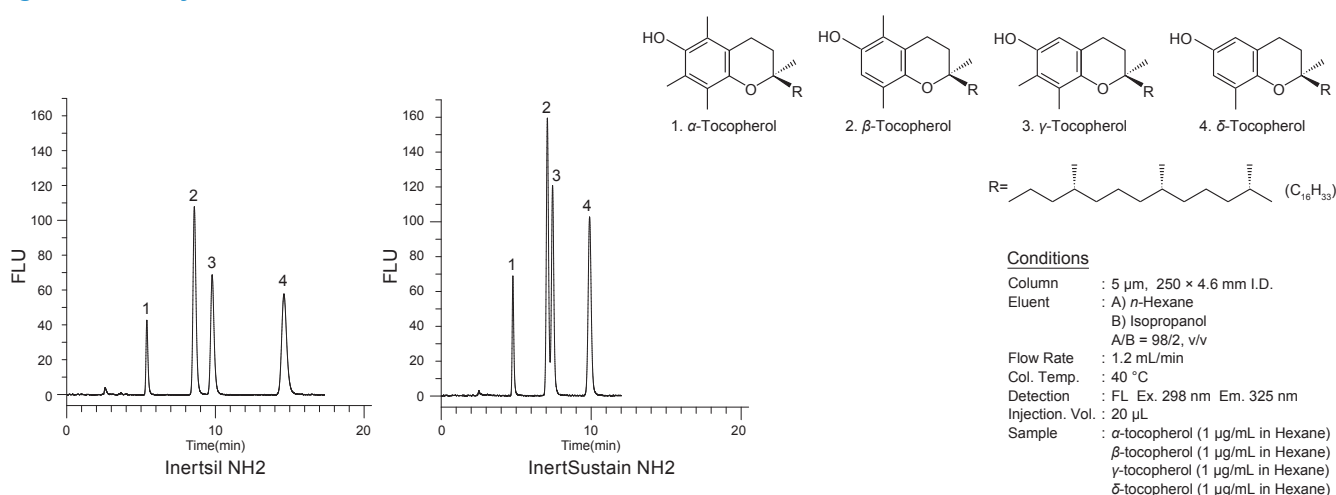
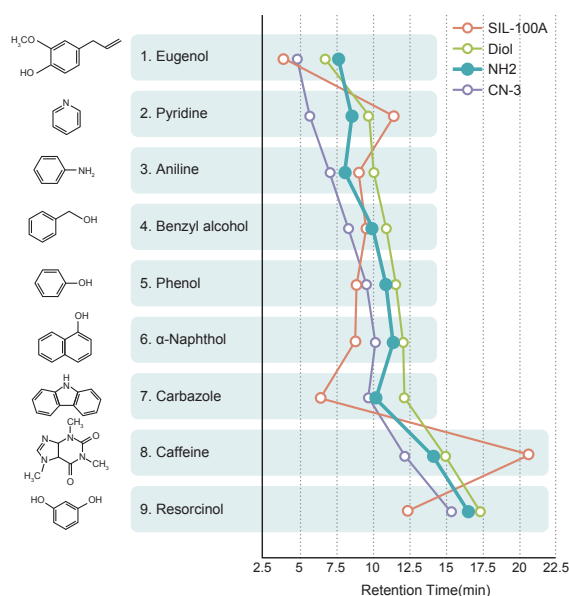
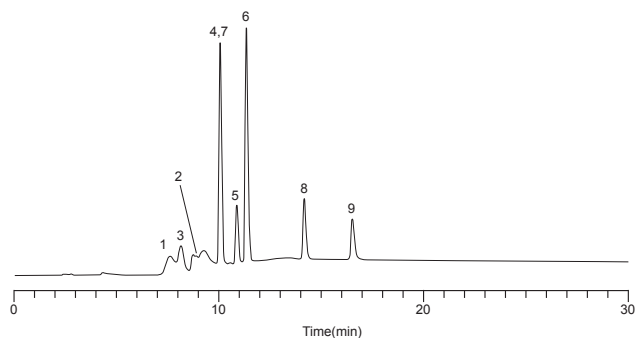


Figure 2 : Selectivity of Inertsil NH2

Conditions

Column : 5 μm , 150 $\times$ 3.0 mm I.D.
 Eluent : A) Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 – 30 min – 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85531	5020-85541		
	50	5020-85532	5020-85542		
	75	5020-85533	5020-85543		
	100	5020-85534	5020-85544		
	150	5020-85535	5020-85545		
	250	5020-85536	5020-85546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05461	5020-05471	5020-05481	5020-05491
	50	5020-05462	5020-05472	5020-05482	5020-05492
	75	5020-05463	5020-05473	5020-05483	5020-05493
	100	5020-05464	5020-05474	5020-05484	5020-05494
	150	5020-05465	5020-05475	5020-05485	5020-05495
	250	5020-05466	5020-05476	5020-05486	5020-05496
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85511	5020-85521		
	50	5020-85512	5020-85522		
	75	5020-85513	5020-85523		
	100	5020-85514	5020-85524		
	150	5020-85515	5020-85525		
	250	5020-85516	5020-85526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05511	5020-05521	5020-05531	5020-05541
	50	5020-05512	5020-05522	5020-05532	5020-05542
	75	5020-05513	5020-05523	5020-05533	5020-05543
	100	5020-05514	5020-05524	5020-05534	5020-05544
	150	5020-05515	5020-05525	5020-05535	5020-05545
	250	5020-05516	5020-05526	5020-05536	5020-05546

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19221	5020-19220	5020-19271	5020-19270
1.5, 2.1		1.5	5020-19321	5020-19320	5020-19371	5020-19370
2.1, 3.0		3.0	5020-19121	5020-19120	5020-19171	5020-19170
4.0, 4.6		4.0	5020-19021	5020-19020	5020-19071	5020-19070
2.1, 3.0	20	3.0	5020-19521	5020-19520	5020-19571	5020-19570
4.0, 4.6		4.0	5020-19421	5020-19420	5020-19471	5020-19470
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain Cyano

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 350 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Functional Group** : Cyanopropyl
- **End-capping** : Yes
- **Carbon Loading** : 8 %
- **USP Code** : L10
- **pH Range** : 2 - 7.5

InertSustain Cyano column is endcapped and bonded with cyanopropyl groups, it can be used in both normal and reversed phase modes. Compounds are difficult to separate in reversed phase mode may be able to separate in normal phase mode (Figure 1). Also since it is end-capped, it can be flushed with highly polar solvents such as 100% water eluent.

InertSustain Cyano column can be also used as reversed phase mode, the delivery solvent is mixture of water and acetonitrile, by replacing the solvent it can use as normal phase column (Figure 2).

Figure 1 : Comparison of Normal Phase Mode and Reversed Phase Mode Analysis

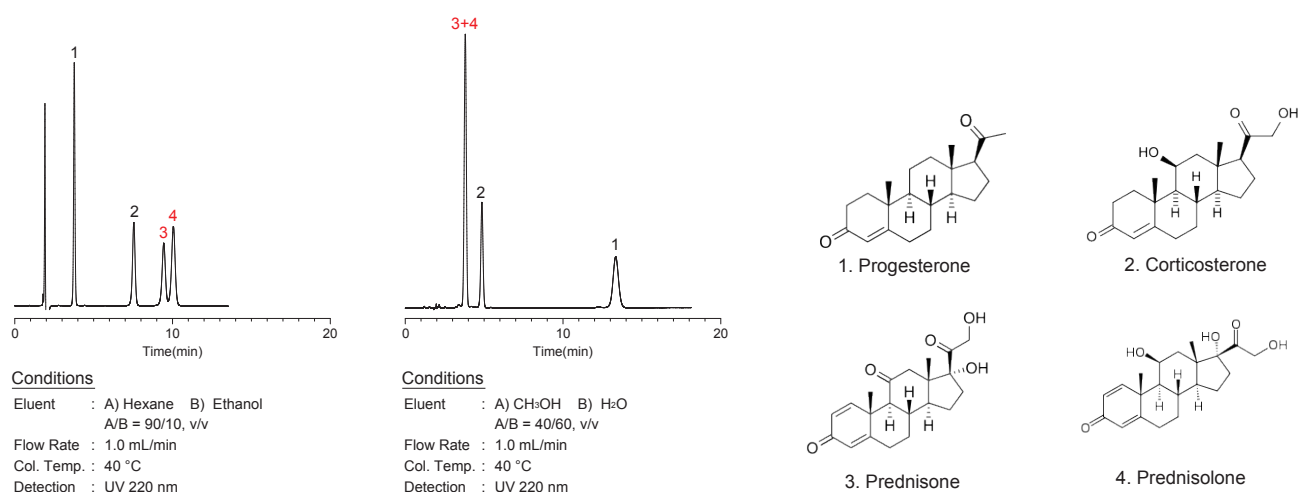
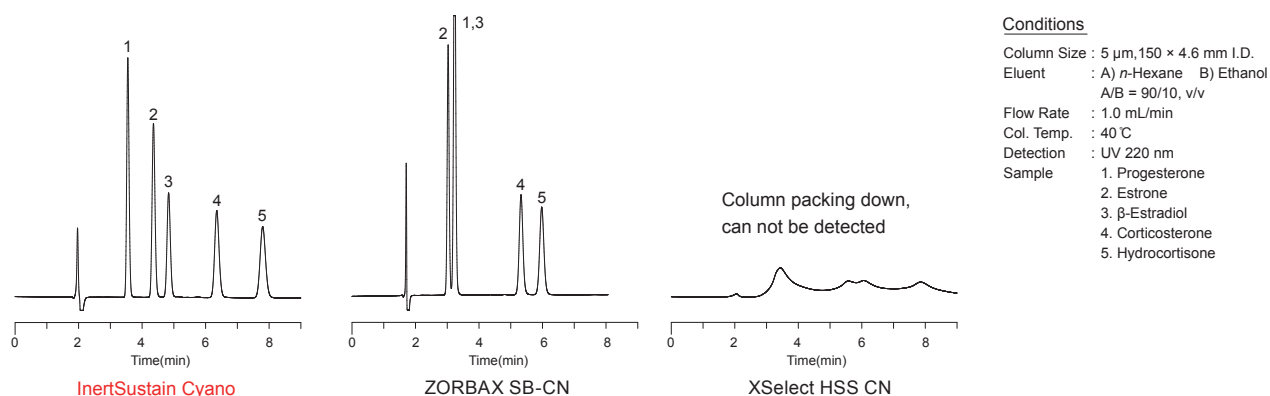


Figure 2: Comparison with Other Brands Column



Analytical Columns

HP Series Particle Size : 3 µm 50 MPa (500 bar)	Length I.D. (mm)	2.1	3.0	4.6	
	30	5020-89459	5020-89465	5020-89471	
	50	5020-89460	5020-89466	5020-89472	
	75	5020-89461	5020-89467	5020-89473	
	100	5020-89462	5020-89468	5020-89474	
	150	5020-89463	5020-89469	5020-89475	
	250	5020-89464	5020-89470	5020-89476	
Particle Size: 3 µm	Length I.D. (mm)	1.0	1.5		
	30	5020-89410	5020-89416		
	50	5020-89411	5020-89417		
	75	5020-89412	5020-89418		
	100	5020-89413	5020-89419		
	150	5020-89414	5020-89420		
	250	5020-89415	5020-89421		
	Length I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89374	5020-89381	5020-89388	5020-89395
	50	5020-89375	5020-89382	5020-89389	5020-89396
	75	5020-89376	5020-89383	5020-89390	5020-89397
	100	5020-89377	5020-89384	5020-89391	5020-89398
Particle Size: 5 µm	Length I.D. (mm)	1.0	1.5		
	30	5020-89288	5020-89294		
	50	5020-89289	5020-89295		
	75	5020-89290	5020-89296		
	100	5020-89291	5020-89297		
	150	5020-89292	5020-89298		
	250	5020-89293	5020-89299		
	Length I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89251	5020-89258	5020-89265	5020-89272
	50	5020-89252	5020-89259	5020-89266	5020-89273
	75	5020-89253	5020-89260	5020-89267	5020-89274
	100	5020-89254	5020-89261	5020-89268	5020-89275
	150	5020-89255	5020-89262	5020-89269	5020-89276
	250	5020-89256	5020-89263	5020-89270	5020-89277

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-89449	5020-89355	5020-89450	5020-89356
1.5, 2.1		1.5	5020-89451	5020-89357	5020-89452	5020-89358
2.1, 3.0		3.0	5020-89447	5020-89353	5020-89448	5020-89354
4.0, 4.6		4.0	5020-89445	5020-89351	5020-89446	5020-89352
2.1, 3.0	20	3.0	5020-89455	5020-89361	5020-89456	5020-89362
4.0, 4.6		4.0	5020-89453	5020-89359	5020-89454	5020-89360
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil CN-3

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Cyanopropyl
- **End-capping** : No
- **Carbon Loading** : 14 %
- **USP Code** : L10
- **pH Range** : 2 - 7.5



Inertsil CN-3, Cyanopropyl groups bonded to Silica gel with high density. And it is not only increase difference recognition of hydrophilicity, but also increase the durability. It is difficult to increase the both performance with other previous cyanopropyl columns. Inertsil CN-3 can be cleaned with 100 % aqueous solvent because non-specific adsorption of water effected with silanol base is prevented.

Figure 2 shows 9 compounds analysis with Inertsil CN-3. And also it shows different selectivity of the other Inertsil series columns. Each compounds are detected adequate retentivity. And then they are easy to use as same as Inertsil Diol on normal phase mode.

Figure1 : Comparison of Selectivity

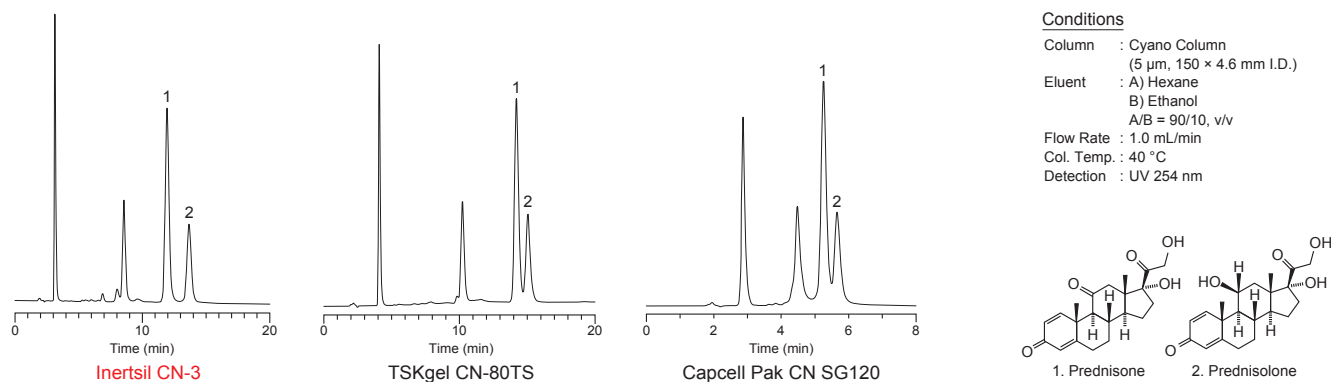
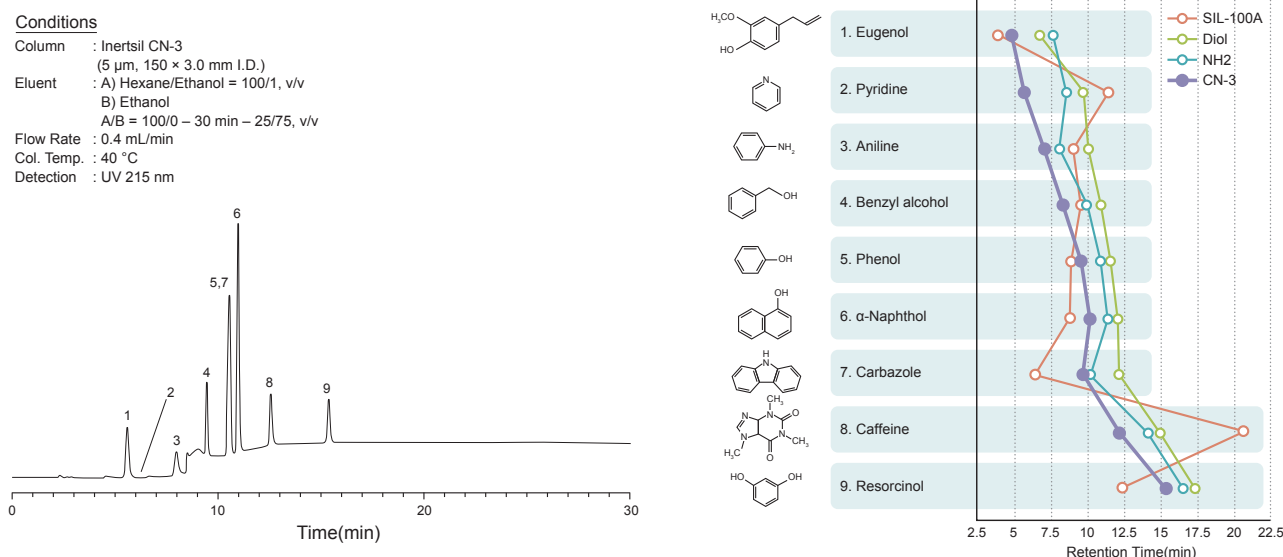


Figure2 : Selectivity of Inertsil® CN-3



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85331	5020-85341		
	50	5020-85332	5020-85342		
	75	5020-85333	5020-85343		
	100	5020-85334	5020-85344		
	150	5020-85335	5020-85345		
	250	5020-85336	5020-85346		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05261	5020-05271	5020-05281	5020-05291
	50	5020-05262	5020-05272	5020-05282	5020-05292
	75	5020-05263	5020-05273	5020-05283	5020-05293
	100	5020-05264	5020-05274	5020-05284	5020-05294
Particle Size: 5 µm	150	5020-05265	5020-05275	5020-05285	5020-05295
	250	5020-05266	5020-05276	5020-05286	5020-05296
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85311	5020-85321		
	50	5020-85312	5020-85322		
	75	5020-85313	5020-85323		
	100	5020-85314	5020-85324		
	150	5020-13712	5020-13710		
	250	5020-85316	5020-85326		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05311	5020-05321	5020-05331	5020-05341
	50	5020-05312	5020-05322	5020-05332	5020-05342
	75	5020-05313	5020-05323	5020-05333	5020-05343
	100	5020-05314	5020-05324	5020-05334	5020-05344
	150	5020-05315	5020-05325	5020-01942	5020-01940
	250	5020-05316	5020-05326	5020-01943	5020-01941

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19219	5020-19218	5020-19269	5020-19268
1.5, 2.1		1.5	5020-19319	5020-19318	5020-19369	5020-19368
2.1, 3.0		3.0	5020-19119	5020-19118	5020-19169	5020-19168
4.0, 4.6		4.0	5020-19019	5020-19018	5020-19069	5020-19068
2.1, 3.0	20	3.0	5020-19519	5020-19518	5020-19569	5020-19568
4.0, 4.6		4.0	5020-19419	5020-19418	5020-19469	5020-19468
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

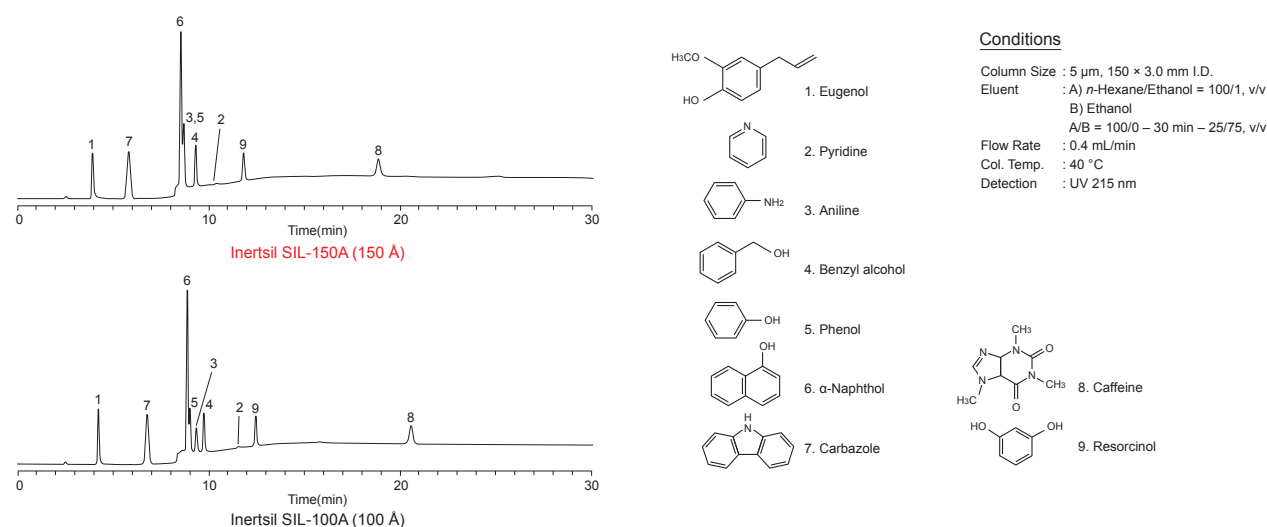
Inertsil SIL-150A

- Base Material : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 320 m^2/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Functional Group : None
- End-capping : No
- Carbon Loading : - %
- USP Code : L3
- pH Range : 2 - 7.5



Inertsil SIL-150A is ultra pure silica gel column, and this ultra pure silica gel contains very low level of metal impurities and is durable and free from dents and cracks which can cause premature column failure. Compared to Inertsil SIL-100A, the silica's surface area is smaller (320 m^2/g). Retentivity of Inertsil SIL-150A is weaker than that of Inertsil SIL-100A (Figure 1).

Figure 1 : Comparison of Retentivity and Selectivity with Different Pore Size



Analytical Columns

Particle Size: 5 μm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01021	5020-01022	5020-01023	5020-01024
	250	5020-01025	5020-01026	5020-01027	5020-01028

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 μm	5 μm
2.1, 3.0	10	3.0	5020-19139	5020-19189
4.0, 4.6		4.0	5020-19039	5020-19089
2.1, 3.0	20	3.0	5020-19539	5020-19589
4.0, 4.6		4.0	5020-19439	5020-19489
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

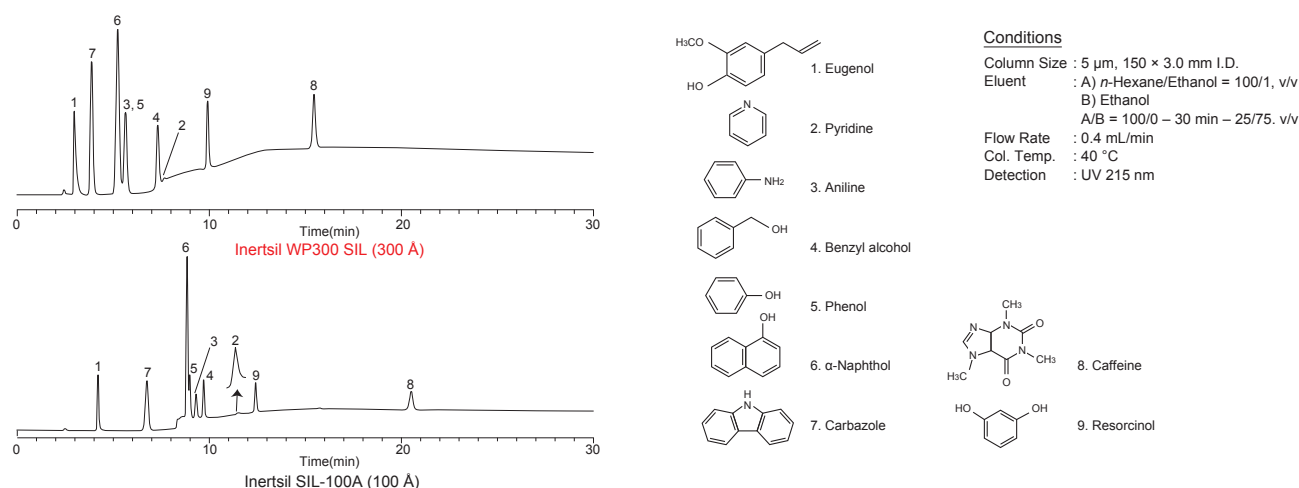
Inertsil WP300 SIL

- **Base Material** : High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 150 m^2/g
- **Pore Size** : 300 Å (30 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : None
- **End-capping** : No
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 - 7.5



Inertsil WP300 SIL is pure silica gel phase with wide pores(300 Å). It is available for analysing compounds including large molecules. As the pore becomes wider, the surface area of silica gel is smaller. Since the interactions between the analyte and silica gel occur on the silica surface, smaller surface area means less interactions and faster elution. In the figure below, Inertsil WP300 SIL and Inertsil SIL-100A are compared to see their separation and eluting speed. The pore size of Inertsil SIL-100A is 100 Å and the surface area is 450 m^2/g . As shown, Inertsil WP300 SIL elutes faster than Inertsil SIL-100A though their separating patterns are similar.

Figure 1 : Comparison of Selectivity and Retentivity with Different Pore Size



Analytical Columns

Particle Size: 5 μm	Length \ I.D. (mm)	1.0		1.5	
	33	5020-86011		5020-86021	
	50	5020-86012		5020-86022	
	75	5020-86013		5020-86023	
	100	5020-86014		5020-86024	
	150	5020-86015		5020-86025	
	250	5020-86016		5020-86026	
	Length \ I.D. (mm)	2.1		3.0	
	33	5020-06011		5020-06021	
	50	5020-06012		5020-06022	
	75	5020-06013		5020-06023	
	100	5020-06014		5020-06024	
	150	5020-06015		5020-06025	
	250	5020-06016		5020-06026	
	Length \ I.D. (mm)	4.0		4.6	
	33	5020-06031		5020-06041	
	50	5020-06032		5020-06042	
	75	5020-06033		5020-06043	
	100	5020-06034		5020-06044	
	150	5020-06035		5020-06045	
	250	5020-06036		5020-06046	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19232	5020-19282
1.5, 2.1		1.5	5020-19332	5020-19382
2.1, 3.0		3.0	5020-19132	5020-19182
4.0, 4.6		4.0	5020-19032	5020-19082
2.1, 3.0	20	3.0	5020-19532	5020-19582
4.0, 4.6		4.0	5020-19432	5020-19482
Holder for Cartridge Guard Column E		For 10 mm Length	5020-08500	
			For 20 mm Length	5020-08550

SEC Columns (GPC/GFC)

• Inertsil Diol	088
• Inertsil WP300 Diol	090

Inertsil Diol

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 μm , 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : No
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5

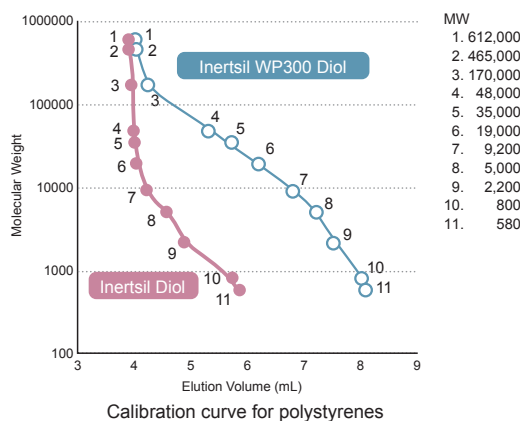


Inertsil Diol, dihydroxypropyl groups chemical bonded onto silica gel, can be used as aqueous SEC (GFC) or organic SEC (GPC) (Figure 1). As features of the packing material, it can analyze with several columns in series since 20 MPa (200 bar) as the maximum operating pressure, and it is higher than polymer base columns.

Figure 2 shows an example of polystyrene analysis with Inertsil Diol and Inertsil WP300 Diol in series. With coupling 2 columns in different pore size in series, it can be used for broader range of molecular weight compared with Figure 1 calibration curve.

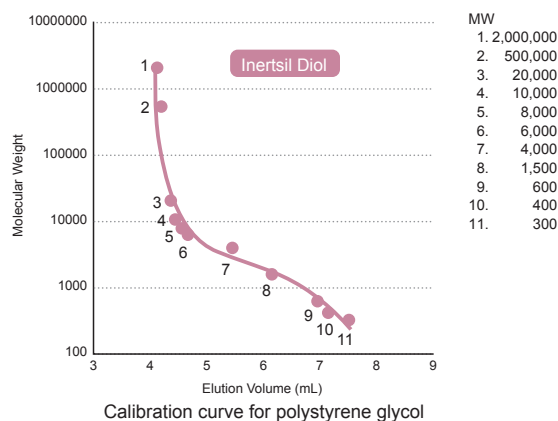
General internal diameter of SEC columns are 7-8 mm. But even if 4.6 mm I.D. column, it can obtain calibration curve with smaller elution volume rather than 7.6 mm I.D. column. Therefore it can be analyzed with saving solvent, environment conservation, and low cost.

Figure1 : Calibration Curve for Aqueous and Organic SEC Analysis



Conditions

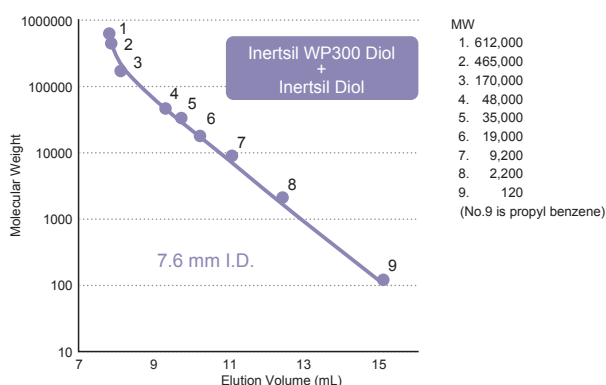
Column : Inertsil WP300 Diol (5 μm , 250 $\times$ 7.6 mm I.D.)
 Eluent : THF
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : UV 254 nm



Conditions

Column : Inertsil Diol (5 μm , 250 $\times$ 7.6 mm I.D.)
 Eluent : H_2O
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}\text{C}$
 Detection : RI (Cell Temp. 35 $^{\circ}\text{C}$)

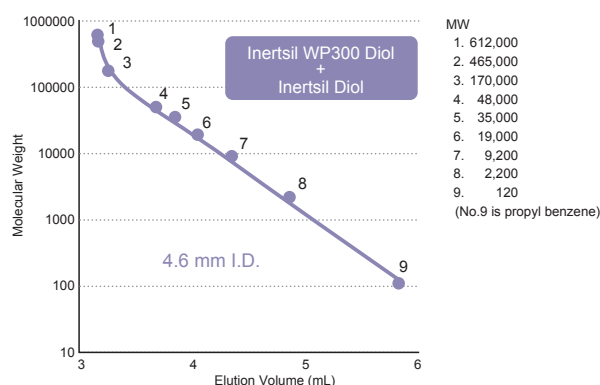
Figure2 : Calibration Curve for Small I.D. SEC Columns



Calibration curve for polystyrene with 7.6 mm I.D. column

Conditions

Column : Inertsil WP300 Diol (5 μm , 250 $\times$ 7.6 mm I.D.)
 + Inertsil Diol (5 μm , 250 $\times$ 7.6 mm I.D.)
 Eluent : THF
 Flow Rate : 1.0 mL/min
 Col. Temp. : 35 $^{\circ}\text{C}$
 Detection : UV 254 nm



Calibration curve for polystyrene with 4.6 mm I.D. column

Conditions

Column : Inertsil WP300 Diol (5 μm , 250 $\times$ 4.6 mm I.D.)
 + Inertsil Diol (5 μm , 250 $\times$ 4.6 mm I.D.)
 Eluent : THF
 Flow Rate : 0.3 mL/min
 Col. Temp. : 35 $^{\circ}\text{C}$
 Detection : UV 254 nm

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86531	5020-86541		
	50	5020-86532	5020-86542		
	75	5020-86533	5020-86543		
	100	5020-86534	5020-86544		
	150	5020-86535	5020-86545		
	250	5020-86536	5020-86546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05411	5020-05421	5020-05431	5020-05441
	50	5020-05412	5020-05422	5020-05432	5020-05442
	75	5020-05413	5020-05423	5020-05433	5020-05443
	100	5020-05414	5020-05424	5020-05434	5020-05444
Particle Size: 5 µm	150	5020-05415	5020-05425	5020-05435	5020-05445
	250	5020-05416	5020-05426	5020-05436	5020-05446
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86511	5020-86521		
	50	5020-86512	5020-86522		
	75	5020-86513	5020-86523		
	100	5020-86514	5020-86524		
	150	5020-86515	5020-86525		
	250	5020-86516	5020-86526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05611	5020-05621	5020-05631	5020-05641
	50	5020-05612	5020-05622	5020-05632	5020-05642
	75	5020-05613	5020-05623	5020-05633	5020-05643
	100	5020-05614	5020-05624	5020-05634	5020-05644
	150	5020-05615	5020-05625	5020-05635	5020-05645
	250	5020-05616	5020-05626	5020-05636	5020-05646
	Length \ I.D. (mm)	6.0	7.6	10	
	50	5020-05652	5020-05662	5020-86552	
	100	5020-05654	5020-05664	5020-86554	
	150	5020-05655	5020-05665	5020-86555	
	250	5020-05656	5020-05666	5020-86556	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19223	5020-19222	5020-19273	5020-19272
1.5, 2.1		1.5	5020-19323	5020-19322	5020-19373	5020-19372
2.1, 3.0		3.0	5020-19123	5020-19122	5020-19173	5020-19172
4.0, 4.6		4.0	5020-19023	5020-19022	5020-19073	5020-19072
2.1, 3.0	20	3.0	5020-19523	5020-19522	5020-19573	5020-19572
4.0, 4.6		4.0	5020-19423	5020-19422	5020-19473	5020-19472
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil WP300 Diol

- **Base Material** : WP300 Series High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 150 m^2/g
- **Pore Size** : 300 Å (30 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : No
- **Carbon Loading** : 9 %
- **USP Code** : L20, L33
- **pH Range** : 2 - 7.5



Inertsil WP300 Diol has dihydroxypropyl group bonded to silica gel with pore size 300 Å and is capable of analyzing large molecules. Like Inertsil Diol, Inertsil WP300 Diol can be used for both aqueous SEC (Size Exclusion Chromatography) and organic SEC. Also, as a diol column, Inertsil WP300 Diol can be used in both normal phase and reversed phase mode.

As the pore size of silica gel is wider than that of Inertsil Diol, Inertsil WP300 Diol is capable of separating compounds with a broader range of molecular weight than Inertsil Diol (Figure 1).

Figure 1 : Calibration Curve and Analysis of Polystyrenes

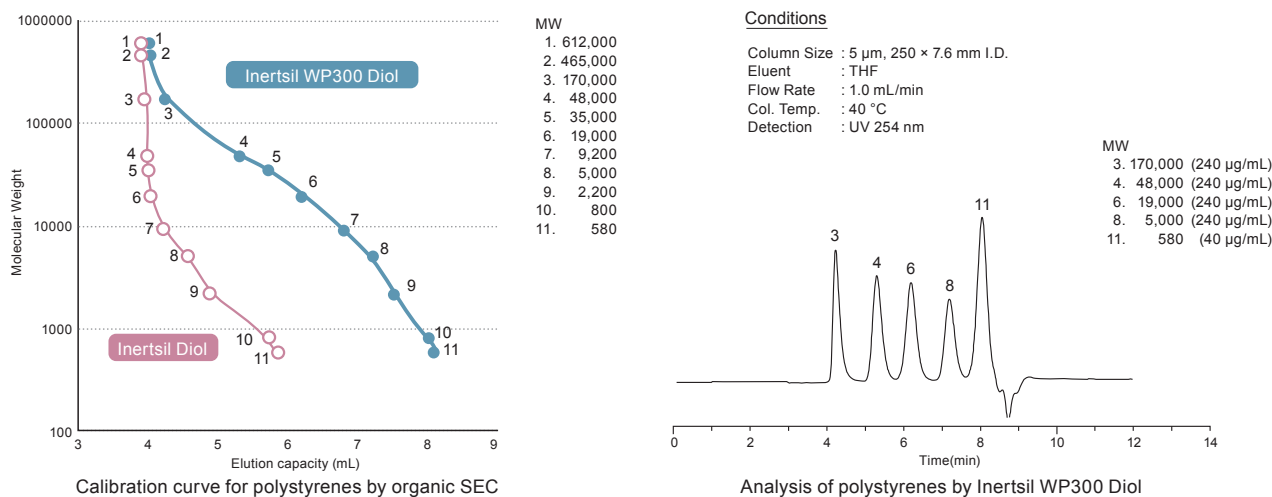
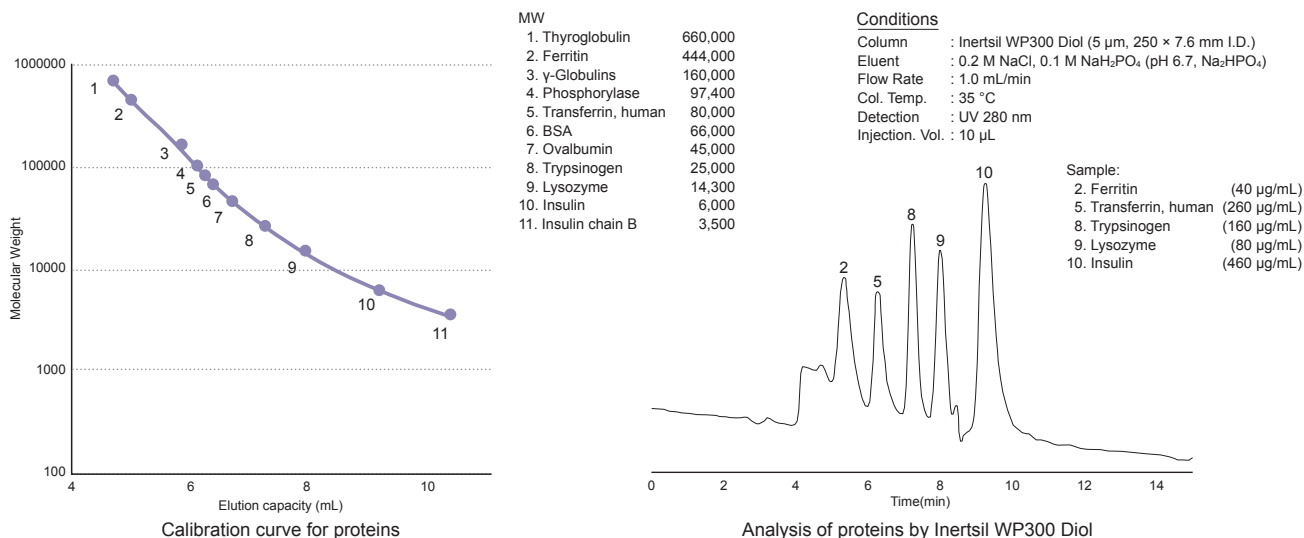


Figure 2 : Calibration Curve and Analysis of Proteins



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5	2.1	3.0	4.0	4.6
	33	5020-85911	5020-85921	5020-05911	5020-05921	5020-05931	5020-05941
	50	5020-85912	5020-85922	5020-05912	5020-05922	5020-05932	5020-05942
	75	5020-85913	5020-85923	5020-05913	5020-05923	5020-05933	5020-05943
	100	5020-85914	5020-85924	5020-05914	5020-05924	5020-05934	5020-05944
	150	5020-85915	5020-85925	5020-05915	5020-05925	5020-05935	5020-05945
	250	5020-85916	5020-85926	5020-05916	5020-05926	5020-05936	5020-05946
	Length \ I.D. (mm)	6.0	7.6	10			
	50	5020-05980	5020-05985	5020-85932			
	100	5020-05981	5020-05986	5020-85934			
	150	5020-05982	5020-05987	5020-85935			
	250	5020-05983	5020-05988	5020-85936			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19231	5020-19281
1.5, 2.1		1.5	5020-19331	5020-19381
2.1, 3.0		3.0	5020-19131	5020-19181
4.0, 4.6		4.0	5020-19031	5020-19081
2.1, 3.0	20	3.0	5020-19531	5020-19581
4.0, 4.6		4.0	5020-19431	5020-19481
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Ion Exchange Columns

• Inertsil AX	094
• Inertsil CX	096

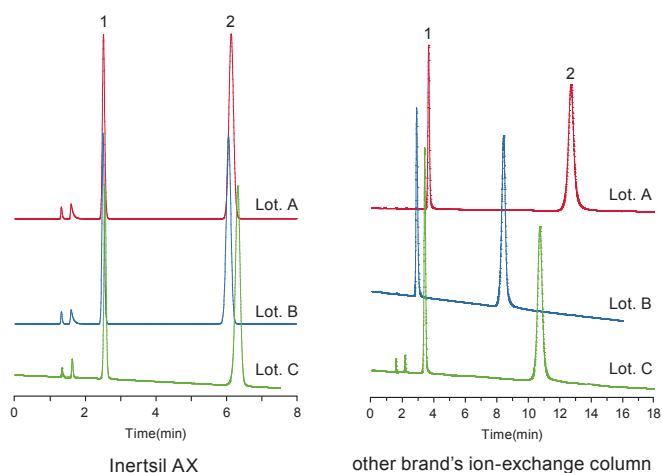
Inertsil AX

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Diethylaminopropyl
- **End-capping** : No
- **Carbon Loading** : 17 %
- **Anion Exchange Capacity** : 0.4 meq/g
- **USP Code** : -
- **pH Range** : 2 - 7.5



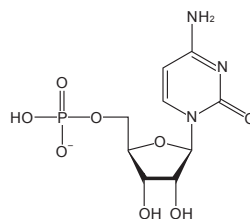
Inertsil AX has diethylamino groups bonded to silica gel by an alkyl chain. The diethylamino groups offer anionic functions required for anion exchange chromatography. It is mainly used for analyses of acidic compounds. Conventional ion-exchange columns used to show inconsistent results from lot to lot. However, Inertsil AX is manufactured under strict quality control in order to offer excellent lot-to-lot reproducibility. The retentivity of Inertsil AX is influenced by the buffer concentration in eluent. The retention time can be adjusted by the concentration of buffer (Figure 2).

Figure 1 : Comparison of Lot-to-lot Reproducibility with Other Brands

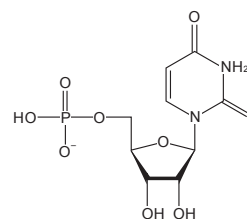


Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : 60 mM KH_2PO_4 (pH 3.0, H_3PO_4)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm
 Injection Vol. : 1 μL
 Sample : 1. Cytidine 5'-monophosphate (CMP)
 2. Uridine 5'-monophosphate (UMP)

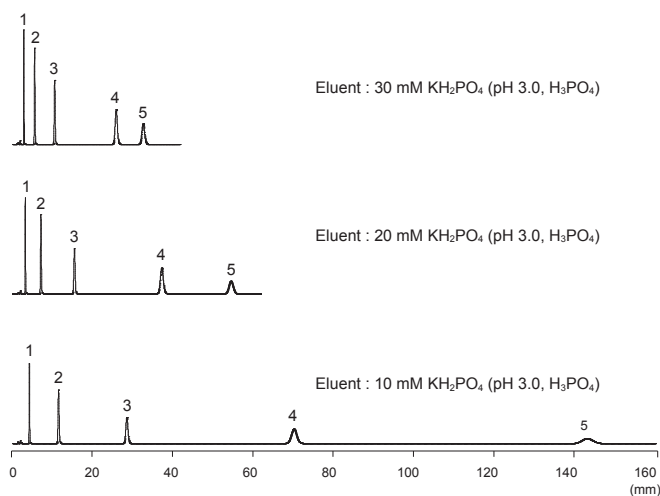


Cytidine 5'-monophosphate (CMP)



Uridine 5'-monophosphate (UMP)

Figure 2 : Effect of Buffer Concentration in Eluent



Conditions

Column : Inertsil AX (5 μm , 150 $\times$ 4.6 mm I.D.)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm
 Injection Vol. : 10 μL
 Sample : 1. Cytidine 5'-monophosphate (CMP)
 2. Adenine 5'-monophosphate (AMP)
 3. Uridine 5'-monophosphate (UMP)
 4. Guanosine 5'-monophosphate (GMP)
 5. Xanthosine 5'-monophosphate (XMP)

Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-80111	5020-80121		
	50	5020-80112	5020-80122		
	75	5020-80113	5020-80123		
	100	5020-80114	5020-80124		
	150	5020-80115	5020-80125		
	250	5020-80116	5020-80126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07211	5020-07221	5020-07231	5020-07241
	50	5020-07212	5020-07222	5020-07232	5020-07242
	75	5020-07213	5020-07223	5020-07233	5020-07243
	100	5020-07214	5020-07224	5020-07234	5020-07244
	150	5020-07215	5020-07225	5020-07235	5020-07245
	250	5020-07216	5020-07226	5020-07236	5020-07246

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19233	5020-19283
1.5, 2.1		1.5	5020-19333	5020-19383
2.1, 3.0		3.0	5020-19133	5020-19183
4.0, 4.6		4.0	5020-19033	5020-19083
2.1, 3.0	20	3.0	5020-19533	5020-19583
4.0, 4.6		4.0	5020-19433	5020-19483
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

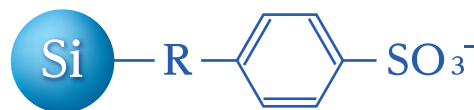
Preparative Columns

Capillary Columns

Applications

Cat. No. Index

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Benzenesulfonyl
- **End-capping** : No
- **Carbon Loading** : 14 %
- **Cation Exchange Capacity** : 0.5 meq/g
- **USP Code** : L9
- **pH Range** : 2 - 7.5



Inertsil CX has benzenesulfonyl groups bonded to silica gel by an alkyl chain. The sulfony groups at the end of the structure offer cationic functions required for the cation exchange chromatography. It is mainly used for analyses of basic compounds. Inertsil CX is manufactured under strict quality control in order to offer excellent batch to batch reproducibility as the same as Inertsil AX. Inertsil CX has high ion exchange capacity and provides high retentivity and selectivity. Therefore, it is also suited for analyzing amino acids and nucleobases shown in Figure 2 and Figure 3.

Figure 1 : Comparison of Ion Exchange Capacity with Other Brands

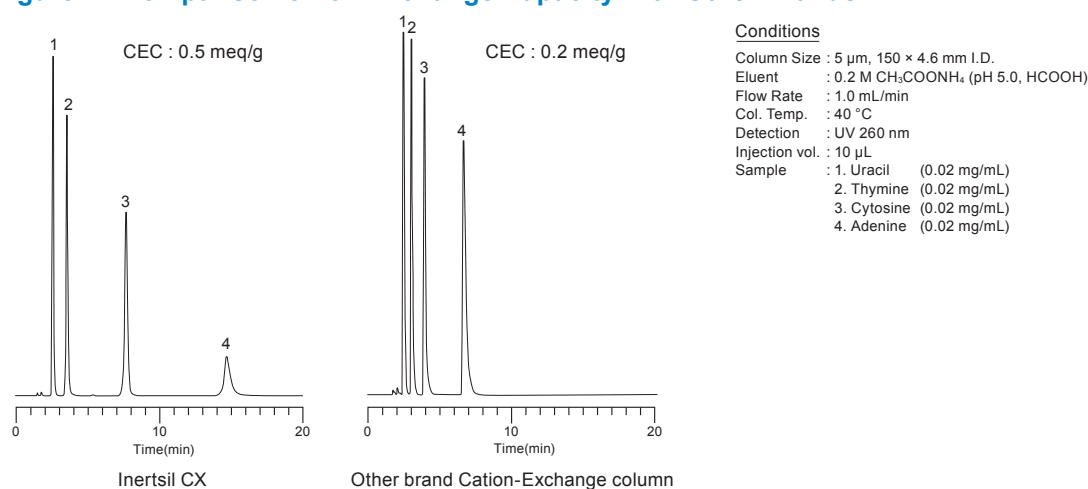


Figure 2 : Biogenic Amine Analysis

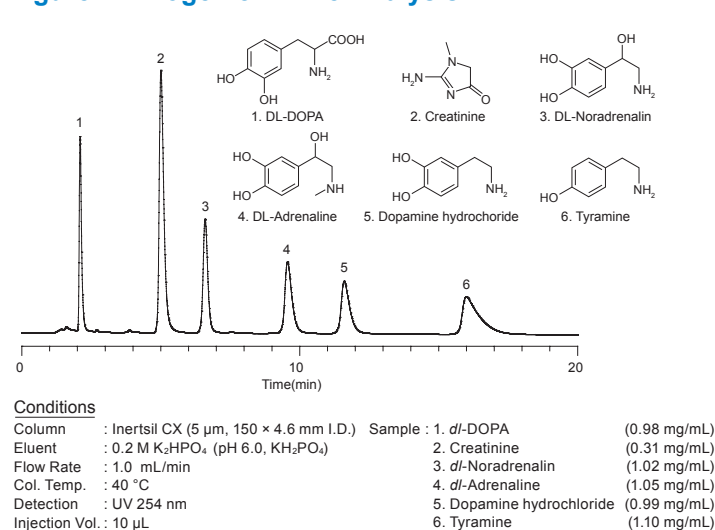
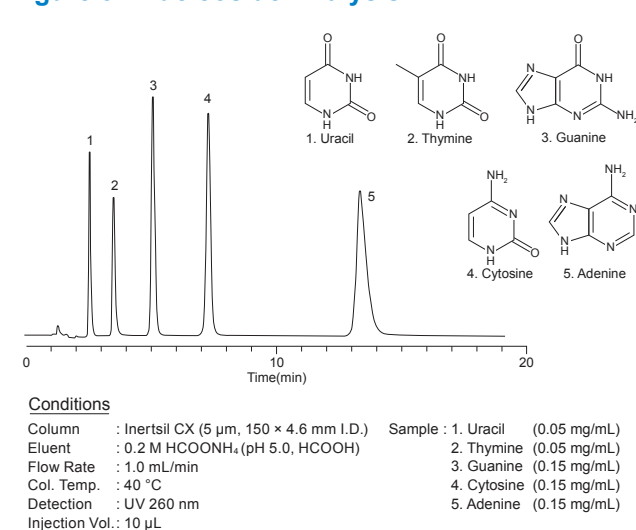


Figure 3 : Nucleoside Analysis



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-80011	5020-80021		
	50	5020-80012	5020-80022		
	75	5020-80013	5020-80023		
	100	5020-80014	5020-80024		
	150	5020-80015	5020-80025		
	250	5020-80016	5020-80026		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07111	5020-07121	5020-07131	5020-07141
	50	5020-07112	5020-07122	5020-07132	5020-07142
	75	5020-07113	5020-07123	5020-07133	5020-07143
	100	5020-07114	5020-07124	5020-07134	5020-07144
	150	5020-07115	5020-07125	5020-07135	5020-07145
	250	5020-07116	5020-07126	5020-07136	5020-07146

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19234	5020-19284
1.5, 2.1		1.5	5020-19334	5020-19384
2.1, 3.0		3.0	5020-19134	5020-19184
4.0, 4.6		4.0	5020-19034	5020-19084
2.1, 3.0	20	3.0	5020-19534	5020-19584
4.0, 4.6		4.0	5020-19434	5020-19484
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

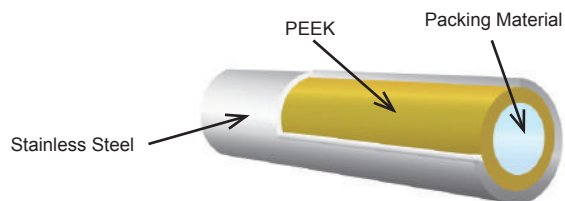


Application Specific Columns

• Metal-Free PEEK Columns	100
• InertSustainBio C18	102
• InterSphere FA-1	103
• SYPRON AX-1	104
• SYPRON AX-2	105
• InterSphere Sugar-1	106
• InterSphere Sugar-2	107
• Inertsil Peptides C18	108
• Inertsil Acrolein C18	108
• Inertsil Sulfa C18	109
• Inertsil AS	109
• Corresponding Pharmacopeia (JP, USP, EP) ...	110
• Corresponding SFC	112

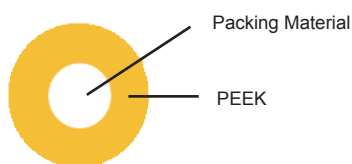
Metal-Free PEEK Columns

UHPLC-PEEK columns



- Material : Wetted Part ... PEEK
Outer Part ... Stainless Steel
- Particle Sizes : 1.9 μm , 2 μm , 3 μm
- Packing Materials : InertSustain & Inertsil series
- Max. Operating Pressure : 80 MPa (800 bar): 1.9 μm , 2 μm
50 MPa (500 bar): 3 μm

PEEK columns



- Material : PEEK
- Particle Sizes : 4 μm , 5 μm , 10 μm
- Packing Materials : InertSustain & Inertsil series
- Max. Operating Pressure : 20 MPa (200 bar)

Analytical Column List

Other packing material or dimensions are on request.

InertSustain C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
2 μm	50	5020-87400	5020-87403
	100	5020-87401	5020-87404
	150	5020-87402	5020-87405
3 μm	50	5020-87412	5020-87416
	100	5020-87413	5020-87417
	150	5020-87414	5020-87418
	250	5020-87415	5020-87419

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 μm	50	5020-87468	5020-87472
	100	5020-87469	5020-87473
	150	5020-87470	5020-87474
	250	5020-87471	5020-87475

InertSustain AQ-C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 μm	50	5020-87068	5020-87065
	100	5020-87069	5020-87066
	150	5020-87070	5020-87067
3 μm	50	5020-87061	5020-87057
	100	5020-87062	5020-87058
	150	5020-87063	5020-87059
	250	5020-87064	5020-87060

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 μm	50	5020-87053	5020-87049
	100	5020-87054	5020-87050
	150	5020-87055	5020-87051
	250	5020-87056	5020-87052

InertSustainSwift C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 μm	50	5020-87548	5020-87551
	100	5020-87549	5020-87552
	150	5020-87550	5020-87553
3 μm	50	5020-87554	5020-87558
	100	5020-87555	5020-87559
	150	5020-87556	5020-87560
	250	5020-87557	5020-87561

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 μm	50	5020-87562	5020-87566
	100	5020-87563	5020-87567
	150	5020-87564	5020-87568
	250	5020-87565	5020-87569

Inertsil ODS-HL

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 μm	50	5020-87532	5020-87536
	100	5020-87533	5020-87537
	150	5020-87534	5020-87538
	250	5020-87535	5020-87539

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 μm	50	5020-87540	5020-87544
	100	5020-87541	5020-87545
	150	5020-87542	5020-87546
	250	5020-87543	5020-87547

Inertsil ODS-4

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87452	5020-87456
	100	5020-87453	5020-87457
	150	5020-87454	5020-87458
	250	5020-87455	5020-87459

Inertsil ODS-3

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87444	5020-87448
	100	5020-87445	5020-87449
	150	5020-87446	5020-87450
	250	5020-87447	5020-87451

InertSustain PFP

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87592	5020-87596
	100	5020-87593	5020-87597
	150	5020-87594	5020-87598
	250	5020-87595	5020-87599

InertSustain Phenylhexyl

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87436	5020-87440
	100	5020-87437	5020-87441
	150	5020-87438	5020-87442
	250	5020-87439	5020-87443

InertSustain Amide

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87420	5020-87424
	100	5020-87421	5020-87425
	150	5020-87422	5020-87426
	250	5020-87423	5020-87427

Inertsil ODS-2

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87460
	250	5020-87461

Inertsil C8

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87462
	250	5020-87463

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87508	5020-87512
	100	5020-87509	5020-87513
	150	5020-87510	5020-87514
	250	5020-87511	5020-87515

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87500	5020-87504
	100	5020-87501	5020-87505
	150	5020-87502	5020-87506
	250	5020-87503	5020-87507

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87600	5020-87604
	100	5020-87601	5020-87605
	150	5020-87602	5020-87606
	250	5020-87603	5020-87607

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87492	5020-87496
	100	5020-87493	5020-87497
	150	5020-87494	5020-87498
	250	5020-87495	5020-87499

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87476	5020-87480
	100	5020-87477	5020-87481
	150	5020-87478	5020-87482
	250	5020-87479	5020-87483

Inertsil WP300 Diol

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87466
	250	5020-87467

Inertsil C4

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87464
	250	5020-87465

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

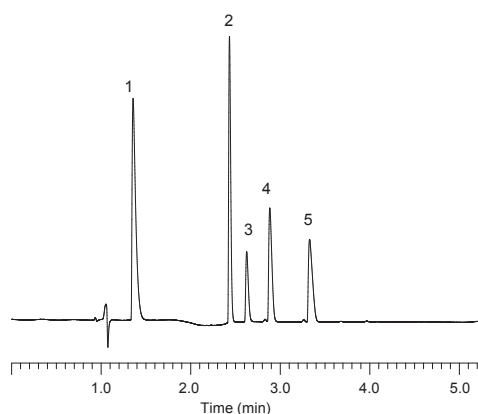
InertSustainBio C18

- **Base Material** : High Purity ES Silica Gel
- **Particle Size** : 1.9 μm , 3 μm
- **Surface Area** : 200 m^2/g
- **Pore Size** : 200 Å (20 nm)
- **Pore Volume** : 1.00 mL/g
- **Functional Group** : Octadecyl

- **End-capping** : Yes
- **Carbon Loading** : 9.0 %
- **USP Code** : L1
- **pH Range** : 1 - 10
- **Max. Operating Pressure** : 80MPa, 800 bar for 1.9 μm columns
50MPa, 500 bar for 3 μm columns

The 200 Å pore size silica creates the opportunity to separate compounds having a molecular weight from small to large molecules. In addition, the usage of highly inert packing material packed into a new Steel-Coated-PEEK hardware deliver excellent peak shapes for various analytes without any adsorption.

Analysis of Peptides



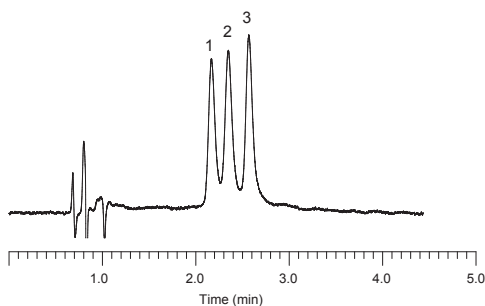
Conditions

Column : InertSustainBio C18
(1.9 μm , 100 $\times$ 2.1 mm I.D.)
Eluent : A) 0.1% HCOOH in H₂O
B) 0.1% HCOOH in CH₃CN
A/B = 95/5 - 0.5 min - 70/30 - 2.5 min - 60/40
- 0.5 min - 60/40 - 0.01/min - 95/5 - 6.49 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Injection Vol. : 5 μL

Sample :

1. Gly-Tyr
2. Val-Tyr-Val
3. Angiotensin II
4. Methionine enkephalin
5. Leucine enkephalin (50 mg/mL each)

Analysis of Oligonucleotides



Conditions

Column : InertSustainBio C18 (1.9 μm , 100 $\times$ 2.1 mm I.D.)
Eluent : A) 0.1 % Triethylamine in H₂O (pH 6.3, CH₃COOH)
B) Eluent A/CH₃CN = 50/50, v/v
A/B = 83/17 - 4 min - 80/20 - 0.1 min - 83/17 - 5.9 min - 83/17, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 260 nm
Injection Vol. : 10 μL
Sample : 1. 5' - GTT ACA GAA TCT GAC AAG CCT AAT ACG - 3' (27 mer)
2. 5' - GTT ACA GAA TCT GCC AAG CCT AAT ACG - 3' (27 mer)
3. 5' - GTT ACA GAA TCT GTC AAG CCT AAT ACG - 3' (27 mer)
(300 pmol/L each)

Analytical Columns

	Length \ I.D. (mm)	2.1	4.6
Particle Size: 1.9 μm	50	5020-89500	5020-87516
	100	5020-89501	5020-87517
	150	5020-89502	5020-87518
Particle Size: 3 μm	50	5020-89503	5020-87520
	100	5020-89504	5020-87521
	150	5020-89505	5020-87522
	250	5020-87519	5020-87523

InertSphere FA-1

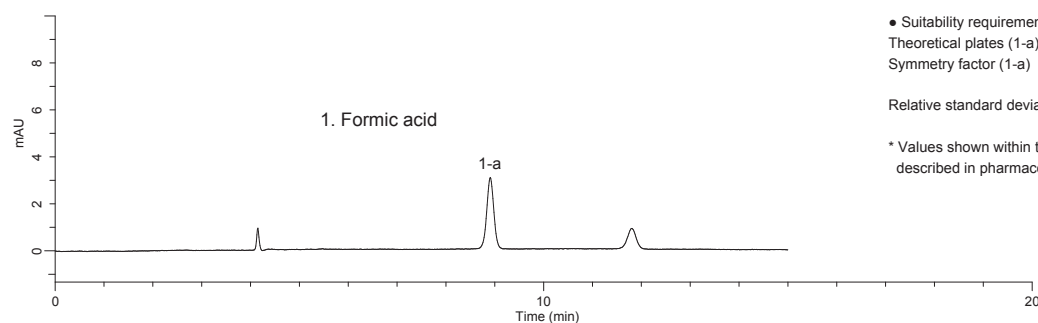
- **Base Material** : Styrene-Divinylbenzene Copolymer
- **Particle Size** : 9 μm
- **Functional Group** : Sulfonate
- **Counter Ion** : H^+
- **USP Code** : L17

Povidone (polyvinylpyrrolidone, PVP) is used in the pharmaceutical industry as a synthetic polymer vehicle for dispersing and suspending drugs. It additionally acts as a disintegrant and tablet binder.

The revision to the harmonized standard for povidone has been approved and formic acid in povidone is now required to be measured.

The new InertSphere FA-1 columns are inspected using a standard solution of formic acid prior to shipment, which is the most appropriate column to be used in this new testing.

Formic Acid



• Suitability requirements

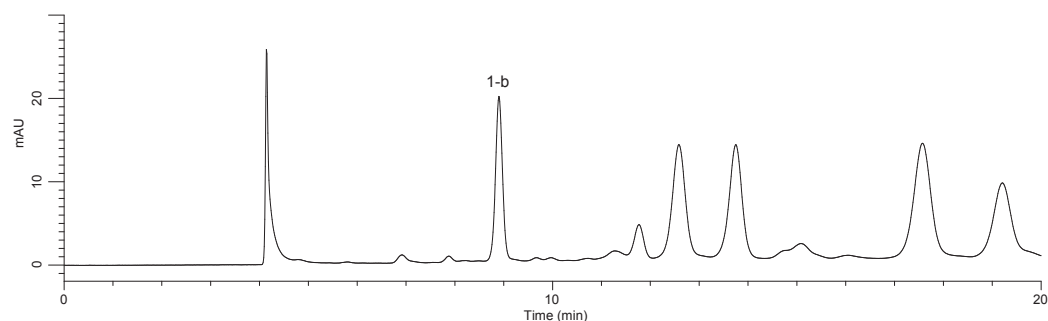
Theoretical plates (1-a) : 17,902 ($\geq 1,000$)*

Symmetry factor (1-a) : ($0.5 \leq$)* 0.99(≤ 1.5)*

Relative standard deviation of peak area (1-a) (%) (n=6) : 0.61 (≤ 2.0)*

* Values shown within the brackets are the criteria described in pharmacopeia methods.

Povidone K15



Ordering Information

Particle Size (μm)	I.D. (mm)	Length (mm)	Cat.No.
9	7.8	300	5020-11003

Other Related Products

Glass Chromatography Column with Fritted Disc and PTFE Stopcock Plug

- Glass Chromatography Column with PTFE and Filter
8 mm I.D. x 200 mm Length
Cat.No. : 6010-23200

For Povidone, Purity Test, Sample Preparation, Packing Material

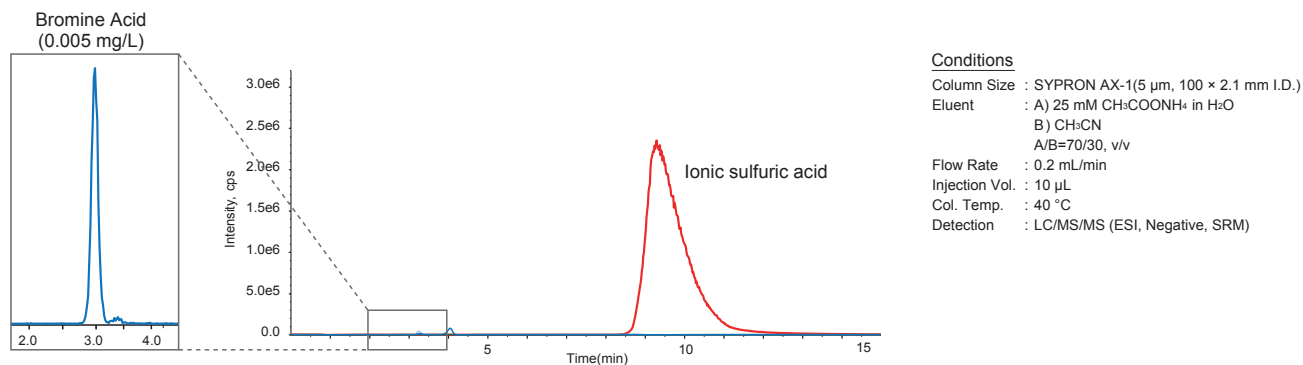
- Packing Material for Glass Chromatography Column
Strong acid ion-exchange resin
MCI GEL CK08P 100 mL
Particle Size : 75 - 150 μm
Counter ion : H^+
Cat.No. : 5055-79540

SYPRON AX-1

- **Base Material** : Methacrylate Polymer
- **Particle Size** : 5 μm
- **Functional Group** : Quaternary Ammonium
- **pH Range** : 2 - 12
- **Recommended operating pH range** : 3 - 7

SYPRON AX-1 is a cation exchange column with quaternary ammonium bonded to hydrophilic polymer. As it's designed to maximize the performance of LC/ MS, it improves separation and efficiency especially of bromate in tap water analysis.

Analysis of Bromine in Tap Water



Analytical Columns

Particle size	I.D. (mm)	Length (mm)	Cat.No.
5 μm	2.1	100	5020-11002

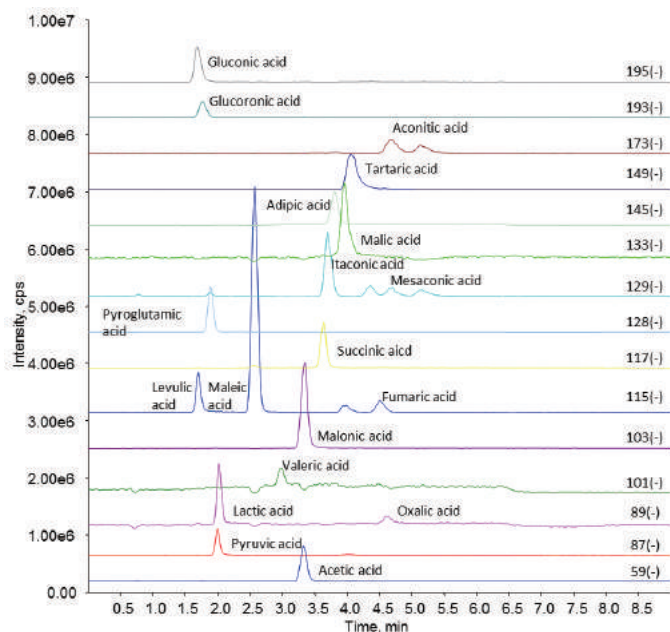
Cartridge Guard Column E

Item	I.D. (mm)	Length (mm)	Cat.No.
SYPRON AX-1 Replacement Cartridge (2 pcs)	2.1	100	5020-08641
SYPRON Guard Holder	—	—	5020-08640

SYPRON AX-2

- **Base Material** : Methacrylate Polymer
- **Particle Size** : 5 µm
- **Functional Group** : Quaternary Ammonium
- **pH Range** : 2 - 12
- **Recommended Operation pH Range** : 3 - 7

SYPRON AX-2 column provides good performance on salt gradient analysis using anion exchange mode with mass chromatography. SYPRON AX-2, is suitable column for organic acid analysis and is able to use with rapid column equilibration time in salt gradient method. As SYPRON AX-2 is an ion exchange column, dicarboxylic acid generally shows weakly retention under reversed phase mode or ion exclusion chromatography, but it can be enhanced strongly using SYPRON AX-2 column.



Conditions

Column : SYPRON AX-2
(5 µm, 150 x 2.1 mm I.D.)
Eluent : A) H₂O/CH₃CN=50/50, v/v
B) 100 mM HCOONH₄
in H₂O/CH₃CN=50/50, v/v
A/B = 90/10 – 5 min – 50/50
– 0.1 min – 90/10, v/v
(total 9 min)
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : LC/MS (ESI, Negative, SRM)
Injection : 10 µL

Particle size	I.D. (mm)	Length (mm)	Material (Watted Part)	Cat. No.
5 µm	2.1	100	PEEK	5020-11006
		150	PEEK	5020-11007

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSphere Sugar-1

- **Base Material** : Styrene Divinylbenzene Copolymer
- **Particle size** : 5 µm
- **Exchange capacity** : 0.7 meq/g
- **Organic solvent resist** : 0 - 100 % (Methanol only)
- **Functional Group** : Quaternary Alkylamine
- **pH Range** : 2 - 14

InertSphere Sugar-1 is a suitable anion-exchange column for sugar analysis. It is packed quaternary ammonium group binding polymer. High sensitivity sugar analysis is available using an electrochemical detector ED723. Especially InertSphere Sugar-1 is suitable for Monosaccharide and Disaccharide analysis.

Note ; Solvent Bottle with CO₂ Trap Cartridge is necessary for analysis to avoid dissolving carbonate ion in the solvent. The Solvent Bottle CO₂ Trap Cartridge contains hazardous material which requires special freight handling. Additional charges apply.

Analytical Column

Particle Size: 5µm	Length (mm)	I.D. (mm)	Cat.No.
	150	4.6	5020-11001

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Cat.No.	Cat.No.
4.6	10	4.0	5020-19048	5020-19098



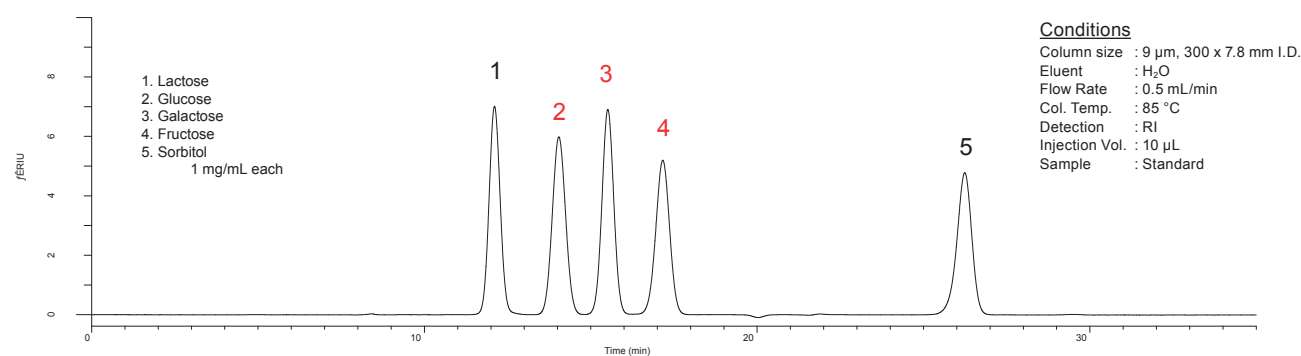
InertSphere Sugar-2

- **Base Material** : Styrene-divinyl Polymer
- **Particle Size** : 9 µm
- **Functional Group** : Sulfo
- **Counter Ion** : Ca²⁺
- **Carbon Load** : 8 %
- **USP Code** : L19

InertSphere Sugar-2 is a column for analysis sugar, it packed with Ca²⁺ loaded resin.

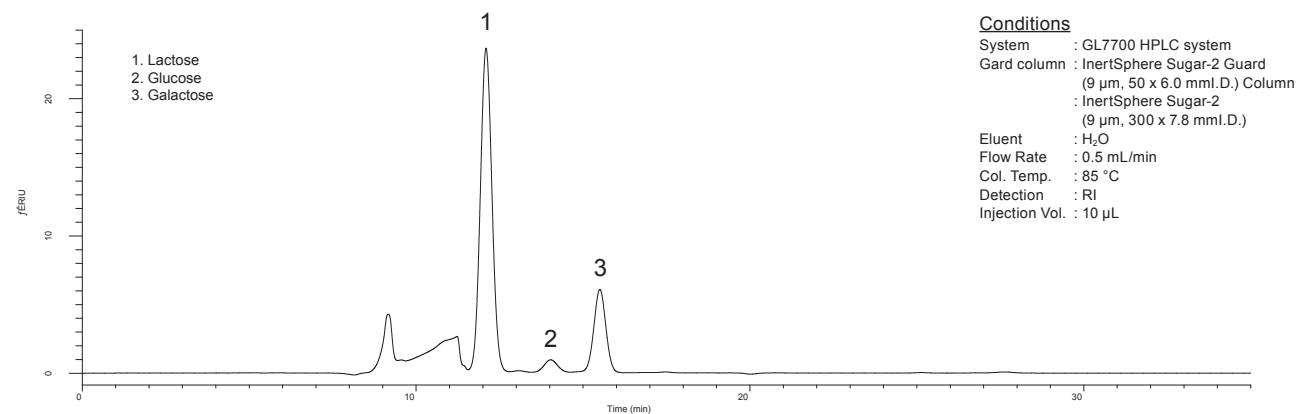
The column mainly is used for Size Exclusion Chromatography (SEC) mode, the elution order is from big molecular weight to small. At the same time, the ligand exchange mode employs ion interaction between metal ions and hydroxyl groups form a complex with the counter ion. Especially this mode is effective for analysis sugar-alcohol. 100% water can be used as eluent, there is no need to prepare mix solvent.

Figure 1 : Sugar (Standard Solution)



InertSphere Sugar-2 separate Glucose, Galactose and Sorbitol which are difficult to be separated by NH₂ columns.

Figure 2 : Analysis of Plain Yogurt



Analytical Column

Particle Size (µm)	Column I.D. (mm)	Column Length (mm)	Cat. No.
9	7.8	300	5020-11000

Guard Column

Particle Size (µm)	Column I.D. (mm)	Column Length (mm)	Cat. No.
9	6	50	5020-10999

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Application Specific Columns

Inertsil Peptides C18

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 4 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5

The whole manufacturing process; synthesis of silica gel, chemical modification, packing, quality test, is under the strict quality control. The number of theoretical plates is as many as 100,000 plates/m.

For peptide mapping, analytical result of standard peptides obtained by each lot is attached to the column. For protein analysis, Inertsil WP300 or Inertsil WP300 C8 is recommended.

Analytical Columns

Particle Size: 4 μm	Length \ I.D. (mm)	1.0	1.5		
	50	5020-08002	5020-08012		
	100	5020-08004	5020-08014		
	150	5020-08005	5020-08015		
	250	5020-08006	5020-08016		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	50	5020-08022	5020-08032	5020-08042	5020-08052
	100	5020-08024	5020-08034	5020-08044	5020-08054
	150	5020-08025	5020-08035	5020-08045	5020-08055
	250	5020-08026	5020-08036	5020-08046	5020-08056

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			4 μm	4 μm
1.0	10	1.0	5020-19211	5020-19261
1.5, 2.1		1.5	5020-19311	5020-19361
2.1, 3.0		3.0	5020-19111	5020-19161
4.0, 4.6		4.0	5020-19011	5020-19061
2.1, 3.0	20	3.0	5020-19511	5020-19561
4.0, 4.6		4.0	5020-19411	5020-19461
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

Inertsil Acrolein C18

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 μm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 9 %
- **USP Code** : L1
- **pH Range** : 2~7.5

Inertsil Acrolein offers rapid separation of DNPH-Acetone and DNPH-Acrolein under a general mobile phase condition such as acetonitrile / water.

Analytical Columns

Particle Size: 5 μm	Length (mm)	I.D. (mm)	Cat.No.
	250	4.6	5020-18051

Application Specific Columns

Inertsil Sulfa C18

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1

As drug residues in food has become a major problem today, developing analytical methods of synthetic bacterial drugs including Sulfa drugs is important. Inertsil Sulfa C18 is a superb ODS column designed for analysis of sulfa drugs.

Each lot of Inertsil Sulfa C18 is tested for the effective separation of sulfa drugs and will be delivered to you with its analytical data.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	100	5020-07504	5020-07514	5020-07524	5020-07534
Particle Size: 5 µm	150	5020-07505	5020-07515	5020-07525	5020-07535
	250	5020-07545	5020-07555	5020-07565	5020-07575
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-07545	5020-07555	5020-07565	5020-07575
Particle Size: 5 µm	250	5020-07546	5020-07556	5020-07566	5020-07576

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
2.1, 3.0	10	3.0	5020-19113	5020-19112	5020-19163	5020-19162
4.0, 4.6		4.0	5020-19013	5020-19012	5020-19063	5020-19062
2.1, 3.0	20	3.0	5020-19513	5020-19512	5020-19563	5020-19562
4.0, 4.6		4.0	5020-19413	5020-19412	5020-19463	5020-19462
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

Inertsil AS

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 450 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1

Inertsil AS is for analysis of arsenic compounds which are toxic compounds exists in environment water. As an arsenic speciation analysis column, simultaneous analysis of arsenic compounds is available with HPLC/ICP-MS.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1
	150	5020-18030
Particle Size: 3 µm	250	5020-18032

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Cat.No.	Cat.No.
2.1	10	1.5	5020-18031	5020-18035
4.6		4.0	5020-18041	5020-18045
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500

Corresponding to Pharmacopeia (JP, USP, EP) Columns

GL Sciences offers various particle sizes and lengths corresponding to Japanese Pharmacopoeias (JP), US Pharmacopoeias (USP) or European Pharmacopoeias (EP).

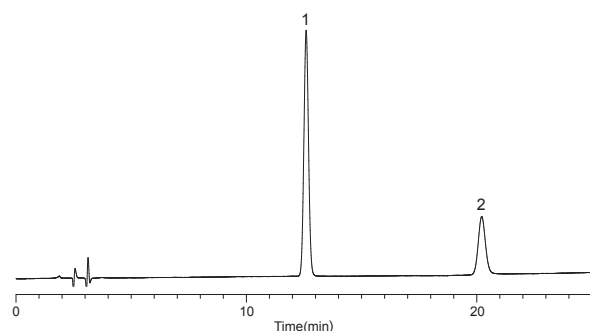
3 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	2.1	50	Inertsil WP300 C18	5020-41100
		150	Inertsil WP300 C18	5020-41101
	3.0	150	Inertsil WP300 C18	5020-41102
	3.9	100	Inertsil ODS-3	5020-89604
		100	Inertsil ODS-4	5020-89605
	4.6	33	Inertsil ODS-SP	5020-87035
		50	Inertsil WP300 C18	5020-41103
		150	Inertsil WP300 C18	5020-41104
		250	Inertsil WP300 C18	5020-41105
SIL	2.1	100	Inertsil WP300 SIL	5020-87047

5 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	3.9	150	InertSustain C18	5020-87030
			Inertsil ODS-4	5020-87023
			Inertsil ODS-3	5020-87008
			Inertsil WP300 C18	5020-87045
		300	InertSustain C18	5020-87031
			Inertsil ODS-4	5020-87024
			Inertsil ODS-3	5020-87009
			Inertsil ODS-2	5020-01120
	4.0	100	Inertsil ODS-SP	5020-87043
		125	Inertsil WP300 C18	5020-87037
		300	InertSustain C18	5020-87032
			Inertsil ODS-4	5020-87025
			Inertsil ODS-3	5020-87010
	4.6	300	InertSustain C18	5020-87033
			Inertsil ODS-4	5020-87026
			Inertsil ODS-3	5020-87011
C8	3.0	60	InertSustain C8	5020-89603
	3.9	150	Inertsil ODS-4	5020-89609
			Inertsil C8	5020-87000
			InertSustain C8	5020-87028
	4.0	80	Inertsil C8-4	5020-87021
			Inertsil C8-3	5020-87005
Phenyl	3.0	100	Inertsil Ph	5020-87022
NH ₂	4.6	125	Inertsil NH2	5020-89601
Pre-column	4.0	25	Inertsil NH2	5020-89602
			InertSustain C18	5020-03399
			InertSustain C8	5020-87040

Figure 1 : Crospovidone



Conditions

Column : InertSustain C18 (5 µm, 250 × 4.0 mm I.D.)
 Guard Column : InertSustain C18 (5 µm, 25 × 4.0 mm I.D.)
 Eluent : A) CH₃CN
 B) H₂O
 A/B = 1/9, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 235 nm
 Injection Vol. : 50 µL

Sample :

1. 1-vinyl-2-pyrrolidone
 2. Vinyl acetate

7 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	4.0	250	Inertsil ODS-3	5020-87012
		300	Inertsil ODS-3	5020-87013
		120	Inertsil ODS-3	5020-87041
	4.6	125	Inertsil ODS-3	5020-87038
		250	Inertsil ODS-3	5020-87014
		300	Inertsil ODS-3	5020-87015
NH ₂	4.6	125	Inertsil NH2	5020-87044

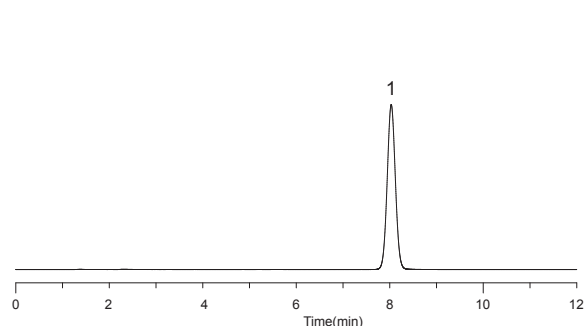
10 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	3.9	300	Inertsil ODS-3	5020-87016
			Inertsil ODS	5020-87002
	4.0	150	Inertsil ODS-3	5020-87017
		250	Inertsil ODS-3	5020-87018
		300	Inertsil ODS-3	5020-87019
			Inertsil ODS	5020-87003
	4.6	300	Inertsil ODS-3	5020-87020
			Inertsil ODS	5020-87004

Other Particle Size HPLC Columns

Particle Size	I.D. (mm)	Length (mm)	Description	Cat. No.
3.5 µm	3.0	150	Inertsil WP300 C18	5020-87034
	4.6	100	Inertsil C8-3	5020-87042
4 µm	3.9	150	Inertsil WP300 C18	5020-89606
	4.0	150	Inertsil WP300 C18	5020-89607
	4.6	150	Inertsil ODS-4	5020-89608

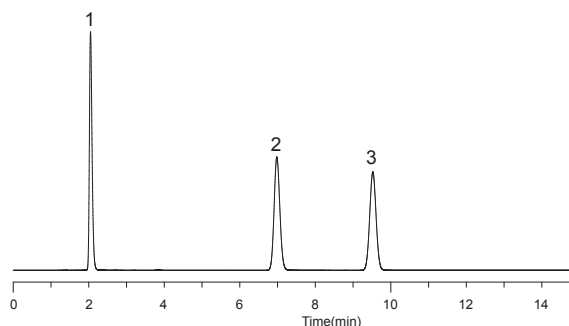
Figure 2: Voriconazole



Conditions

Column : Inertsil WP300 C18 (4 µm, 150 × 3.9 mm I.D.)
 Eluent : A) CH₃CN B) CH₃OH C) Buffer*
 A/B/C = 15/30/55, v/v/v
 Flow Rate : 1.06 mL/min
 Col. Temp. : 35 °C
 Detection : UV 256 nm
 Injection Vol. : 20 µL
 Sample : 1. Voriconazole (25 mg/L)
 *Dissolve 1.9 g of ammonium formate in 1000 mL of water.
 Adjust pH 4.0 by formic acid.

Figure 3: Candesartan • Hydrochlorothiazide



Conditions

Column : Inertsil ODS-4 (4 µm, 150 × 4.6 mm I.D.)
 Eluent : A) CH₃CN B) Buffer* A/B = 11/9, v/v
 Flow Rate : 0.98 mL/min
 Col. Temp. : 25 °C
 Detection : UV 254 nm
 Injection Vol. : 10 µL

Sample:

1. Hydrochlorothiazide (62 mg/L)
 2. Candesartan cilexetil (40 mg/L)
 3. Benzophenone (10 mg/L)

*Dissolve 7.80 g of sodium dihydrogenphosphate dihydrate in 900 mL of water.
 Adjust pH 5.5 by sodium hydroxide.
 Add water to make 1,000 mL.

Corresponding SFC

Mainly supercritical CO₂ is used as mobile phase in SFC (Supercritical Fluid Chromatography). It is said suitable for high speed analysis because of lower viscosity than the general HPLC mobile phase and fast diffusion speed is fast in mobile phase. It is exceptional method for preparative and purification purpose because almost mobile phase is volatilized when back to normal pressure.

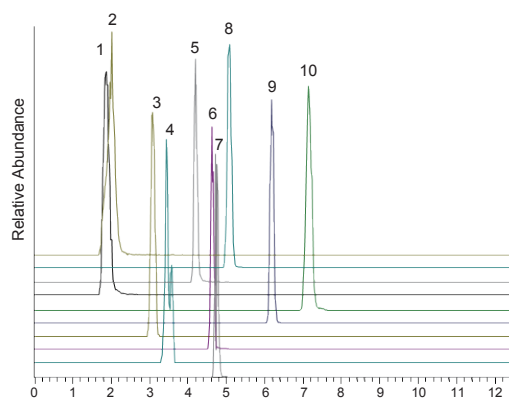
InertSustain and Inertsil series columns are available for SFC analysis.

The packing materials are the same as HPLC columns but they are packed in stainless tubes which correspond to SFC.

Various packing materials are available, and then utilize for expand the SFC application range.

Example of SFC/MS Analysis

Ten(10) kinds of pesticides are analyzed with Inertsil ODS-EP which contains a polar group embedded between the silica surface and Octadecyl group (C18) as the below. The separation patterns are different from polar group chemical bonded column like mainly used on SFC.



Conditions

Column Size : Inertsil ODS-EP (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) Supercritical carbon dioxide
 B) 0.1 % ammonium formate in methanol
 A/B = 95/5 - 1 min - 95/5 - 2 min - 90/10 - 10 min - 80/20
Flow Rate : 3 mL/min
Col. Temp. : 35 $^{\circ}$ C
Injection vol. : 5 μ L
Back Pressure : 10 MPa (100 bar)

Sample:

- | | |
|-----------------------------|-------------------|
| 1. Methamidophos | 6. Chlorfluazuron |
| 2. Acetamiprid | 7. Acequinocyl |
| 3. Carbenfentimidazole | 8. Pyridaben |
| 4. Dimethirimol | 9. Cypermethrin |
| 5. Emamectin benzoate (B1a) | 10. Etofenprox |

This data is provided by Prof. Dr. Bamba, Osaka University.

About packing materials

InertSustain and Inertsil series are available. Contact us for the details.

* Inspected with HPLC only, not with SFC.

Sizes

The following four(4) sizes are available as standard SFC columns.

Please describe the packing materials when you order.

Description	Cat.No.
Corresponding SFC column 5 μ m, 2.1 $\times$ 150 mm	5020-01007
Corresponding SFC column 5 μ m, 4.6 $\times$ 150 mm	5020-01005
Corresponding SFC column 5 μ m, 4.6 $\times$ 250 mm	5020-01006
Corresponding SFC column 5 μ m, 10 $\times$ 250 mm	5020-01008
Corresponding SFC column 5 μ m, 20 $\times$ 250 mm	5020-01009

* Maximum operating column pressures are 28 MPa (280 bar) on 2.1 $\times$ 150 mm and 25 MPa (250 bar) on 4.6 $\times$ 250 mm.

Guard Columns

• How to Select a Guard Column	114
• Cartridge Guard Column E	115
• Cartridge Guard Column Ei (Non-metal type) ...	116
• Guard Columns for UHPLC	118
• GL Cart	120
• Packed Guard Columns, Mini Guard Columns ...	121
• SILFILTER STD C18	126
• Filters, Impurity Remove Columns	127

How to Select a Guard Column

Guard columns are installed between the injector and the analytical column of a HPLC system, mainly to protect analytical columns. Guard columns are widely used as a cost effective for prolong HPLC column life. Exchangeable cartridge design and unchangeable packing design are offered.

Exchangeable cartridge design contains holder and cartridge column, and the cartridge columns are disposable, easy-to-use, and you can change the guard column in seconds.

Packed design is packed as same as analytical column, using as a guard column.

Guard column design	Description	Compatible analytical columns' I.D.	Guard columns' length
Exchangeable Cartridge design	Cartridge Guard Column E First choice for Guard Column	1.0 - 1.5 mm	10 mm
		2.1 - 4.6 mm	10, 20 mm
	Cartridge Guard Column Ei Guard column with PEEK inlet and outlet	1.0 - 3.0 mm	10 mm
	UHPLC Guard Column For high speed, high efficiency separations	1.0 - 3.0 mm	10 mm
	SILFILTER STD C18 Almightily for various ODS columns	3.0 - 4.6 mm	10 mm
Unchangeable packed design	GL-Cart Guard Column Direct-Connection and Indirect-Connection designs with economic cost	4.0, 4.6 mm	5 mm
	Packed Guard Column Packed as same as analytical column	1.0 - 4.6 mm	33, 50 mm
	Packed Mini Guard Column Short length type of packed guard column	4.0, 4.6 mm	10 mm
	Preparative Guard Column Guard columns for preparative columns	6.0 - 100 mm	50 mm 75 mm (for 50 mm I.D.) 100 mm (for 100 mm I.D.)

How to Select a Packing Material

When selecting the packing material for the guard columns, we recommend to choose the same with analytical columns'. However, SILFILTER STD C18 is a monolithic guard column, it can fit different kinds of ODS columns.

How to Select Dimensions

- Particle size : To not alter the chromatography of the analytical column, the packing of the guard column should be the same as the analytical column.
- Inner diameter : Choose a guard column with an internal diameter similar to the analytical column internal diameter.

Connectors

Universal self-adjusting connector – Column Coupler, using for when connect guard columns and analytical column.



Pre-column Coupler W (PCTFE)



Pre-column Coupler SUS

Cartridge Guard Column E



Cartridge Guard Column E

Cartridge guard column E designed with a special holder and cartridge, universal self-adjusting connections, reusable by changing cartridges.

Cartridges contain the same high performance packing material that are used in our GL Sciences analytical columns. Easy-to-use, convenient, and disposable guard columns protect your more expensive analytical columns.

Line-up list

InertSustain C18

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19250	5020-19249	5020-19300	5020-19299
1.5, 2.1		1.5	5020-19350	5020-19349	5020-19400	5020-19399
2.1, 3.0		3.0	5020-19150	5020-19149	5020-19200	5020-19199
4.0, 4.6		4.0	5020-19050	5020-19049	5020-19100	5020-19099
2.1, 3.0	20	3.0	5020-19550	5020-19549	5020-19600	5020-19599
4.0, 4.6		4.0	5020-19450	5020-19449	5020-19500	5020-19499

InertSustain AQ-C18

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-89910	5020-89808	5020-89911	5020-89809
1.5, 2.1		1.5	5020-89912	5020-89810	5020-89913	5020-89811
2.1, 3.0		3.0	5020-89908	5020-89806	5020-89909	5020-89807
4.0, 4.6		4.0	5020-89906	5020-89804	5020-89907	5020-89805
2.1, 3.0	20	3.0	5020-89916	5020-89814	5020-89917	5020-89815
4.0, 4.6		4.0	5020-89914	5020-89812	5020-89915	5020-89813

Inertsil ODS-3

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)		
			Particle Size			Particle Size		
			3 µm	4 µm	5 µm	3 µm	4 µm	5 µm
1.0	10	1.0	5020-19205	5020-19204	5020-19203	5020-19255	5020-19254	5020-19253
1.5, 2.1		1.5	5020-19305	5020-19304	5020-19303	5020-19355	5020-19354	5020-19353
2.1, 3.0		3.0	5020-19105	5020-19104	5020-19103	5020-19155	5020-19154	5020-19153
4.0, 4.6		4.0	5020-19005	5020-19004	5020-19003	5020-19055	5020-19054	5020-19053
2.1, 3.0	20	3.0	5020-19505	5020-19504	5020-19503	5020-19555	5020-19554	5020-19553
4.0, 4.6		4.0	5020-19405	5020-19404	5020-19403	5020-19455	5020-19454	5020-19453

Inertsil ODS-HL

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-87305	5020-87209	5020-87306	5020-87210
1.5, 2.1		1.5	5020-87307	5020-87211	5020-87308	5020-87212
2.1, 3.0		3.0	5020-87303	5020-87207	5020-87304	5020-87208
4.0, 4.6		4.0	5020-87301	5020-87205	5020-87302	5020-87206
2.1, 3.0	20	3.0	5020-87311	5020-87215	5020-87312	5020-87216
4.0, 4.6		4.0	5020-87309	5020-87213	5020-87310	5020-87214

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Cartridge Guard Column Ei (Non-metal type)



Cartridge Guard Column Ei (Non-metal type)

Cartridge Guard column Ei is a special design for the separation which need to avoid the metal accessible surface. It is signed with a special PEEK holder and cartridge.

* Length of Cartridge Guard Column Ei is 10 mm

InertSustain C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19849	5020-19899
3.0	3.0	5020-19749	5020-19799

InertSustainSwift C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88117	5020-88118
3.0	3.0	5020-88115	5020-88116

Inertsil ODS-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19801	5020-19851
3.0	3.0	5020-19701	5020-19751

Inertsil ODS-2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19935	5020-19985
2.1	2.1	5020-19835	5020-19885
3.0	3.0	5020-19735	5020-19785

Inertsil ODS-P

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19908	5020-19958
2.1	2.1	5020-19808	5020-19858
3.0	3.0	5020-19708	5020-19758

InertSustain C8

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16118	5020-16119
3.0	3.0	5020-16116	5020-16117

Holder for Cartridge Guard Column Ei

Length	Qty	Cat. No.
10 mm	1 pcs	5020-08650

InertSustain AQ-C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-89818	5020-89819
3.0	3.0	5020-89816	5020-89817

Inertsil ODS-HL

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-87219	5020-87220
3.0	3.0	5020-87217	5020-87218

Inertsil ODS-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19803	5020-19853
3.0	3.0	5020-19703	5020-19753

Inertsil ODS-SP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19906	5020-19956
2.1	2.1	5020-19806	5020-19856
3.0	3.0	5020-19706	5020-19756

Inertsil ODS-EP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19910	5020-19960
2.1	2.1	5020-19810	5020-19860
3.0	3.0	5020-19710	5020-19760

InertSustainSwift C8

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88419	5020-88420
3.0	3.0	5020-88417	5020-88418

Inertsil C8-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19846	5020-19896
3.0	3.0	5020-19746	5020-19796

InertSustain Phenylhexyl

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-89117	5020-89118
3.0	3.0	5020-89115	5020-89116

Inertsil Ph-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19816	5020-19866
3.0	3.0	5020-19716	5020-19766

Inertsil CN-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19818	5020-19868
3.0	3.0	5020-19718	5020-19768

InertSustain Amide

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88719	5020-88720
3.0	3.0	5020-88717	5020-88718

Inertsil HILIC

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19824	5020-19874
3.0	3.0	5020-19724	5020-19774

Inertsil NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19820	5020-19870
3.0	3.0	5020-19720	5020-19770

Inertsil SIL-100A

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19826	5020-19876
3.0	3.0	5020-19726	5020-19776

InertSustain PFP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-87817	5020-87818
3.0	3.0	5020-87815	5020-87816

InertSustain Phenyl

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16418	5020-16419
3.0	3.0	5020-16416	5020-16417

InertSustain Cyano

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	1.5	5020-89367	5020-89368
3.0	3.0	5020-89365	5020-89366

Inertsil WP300 C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19828	5020-19878
3.0	3.0	5020-19728	5020-19778

Inertsil Amide

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-20179	5020-20181
3.0	3.0	5020-20175	5020-20177

InertSustain NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16718	5020-16719
3.0	3.0	5020-16716	5020-16717

Inertsil Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19822	5020-19872
3.0	3.0	5020-19722	5020-19772

Inertsil WP300 Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19831	5020-19881
3.0	3.0	5020-19731	5020-19781

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Guard Columns for UHPLC



Holder for UHPLC Guard Column



Replacement Cartridge Guard Column

Guard column for UHPLC significantly extends column lifetime of your analytical column. The replacement cartridge guard column can be exchanged easily. A 1/16 inch tube is connected at the outlet of the holder for easy installation with minimized dead volume.

Specifications

- **Base Material** : High Purity Silica Gel
- **Particle Size** : 2 μm , 3 μm
- **Max. Operating Pressure** : 80 MPa (800 bar)
- **Analytical column I.D.** : 1.0 - 3.0 mm I.D.

InertSustain C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 μm	Particle Size 3 μm	Particle Size 2 μm	Particle Size 3 μm
10	1.5	5020-20314	5020-20306	5020-20365	5020-20357
	2.1	5020-20331	5020-20323	5020-20382	5020-20374
	3.0	5020-20348	5020-20340	5020-20399	5020-20391

InertSustain AQ-C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 μm	Particle Size 3 μm	Particle Size 1.9 μm	Particle Size 3 μm
10	1.5	5020-89944	5020-89824	5020-89947	5020-89827
	2.1	5020-89945	5020-89825	5020-89948	5020-89828
	3.0	5020-89946	5020-89826	5020-89949	5020-89829

InertSustainSwift C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 μm	Particle Size 3 μm	Particle Size 1.9 μm	Particle Size 3 μm
10	1.5	5020-88238	5020-88237	5020-88244	5020-88243
	2.1	5020-88240	5020-88239	5020-88246	5020-88245
	3.0	5020-88242	5020-88241	5020-88248	5020-88247

Inertsil ODS-HL

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 3 μm		Particle Size 3 μm	
10	1.5	5020-87333		5020-87336	
	2.1	5020-87334		5020-87337	
	3.0	5020-87335		5020-87338	

Inertsil ODS-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 μm	Particle Size 3 μm	Particle Size 2 μm	Particle Size 3 μm
10	1.5	5020-20309	5020-20300	5020-20360	5020-20351
	2.1	5020-20326	5020-20317	5020-20377	5020-20368
	3.0	5020-20343	5020-20334	5020-20394	5020-20385

Inertsil ODS-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 μm	Particle Size 3 μm	Particle Size 2 μm	Particle Size 3 μm
10	1.5	5020-20311	5020-20301	5020-20362	5020-20352
	2.1	5020-20328	5020-20318	5020-20379	5020-20369
	3.0	5020-20345	5020-20335	5020-20396	5020-20386

Inertsil ODS-SP

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 3 μm		Particle Size 3 μm	
10	1.5	5020-20302		5020-20353	
	2.1	5020-20319		5020-20370	
	3.0	5020-20336		5020-20387	

InertSustain C8

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 3 µm
10	1.5	5020-20315	5020-20307	5020-20366	5020-20358
	2.1	5020-20332	5020-20324	5020-20383	5020-20375
	3.0	5020-20349	5020-20341	5020-20400	5020-20392

InertSustainSwift C8

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 µm	Particle Size 3 µm	Particle Size 1.9 µm	Particle Size 3 µm
10	1.5	5020-88539	5020-88527	5020-88542	5020-88530
	2.1	5020-88540	5020-88528	5020-88543	5020-88531
	3.0	5020-88541	5020-88529	5020-88544	5020-88532

Inertsil C8-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 3 µm
10	1.5	5020-20310	5020-20305	5020-20361	5020-20356
	2.1	5020-20327	5020-20322	5020-20378	5020-20373
	3.0	5020-20344	5020-20339	5020-20395	5020-20390

Inertsil C8-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 3 µm
10	1.5	5020-20312	5020-20303	5020-20363	5020-20354
	2.1	5020-20329	5020-20320	5020-20380	5020-20371
	3.0	5020-20346	5020-20337	5020-20397	5020-20388

InertSustain PFP

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-87821	5020-87824
	2.1	5020-87822	5020-87825
	3.0	5020-87823	5020-87826

InertSustain Phenylhexyl

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-89227	5020-89230
	2.1	5020-89228	5020-89231
	3.0	5020-89229	5020-89232

InertSustain Phenyl

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 3 µm
10	1.5	5020-20316	5020-20308	5020-20367	5020-20359
	2.1	5020-20333	5020-20325	5020-20384	5020-20376
	3.0	5020-20350	5020-20342	5020-20401	5020-20393

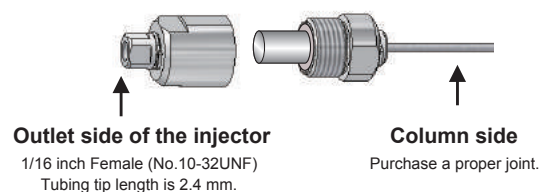
Inertsil Ph-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 3 µm
10	1.5	5020-20313	5020-20304	5020-20364	5020-20355
	2.1	5020-20330	5020-20321	5020-20381	5020-20372
	3.0	5020-20347	5020-20338	5020-20398	5020-20389

Holder

Description	Cat. No.
Holder for UHPLC Guard Column	5020-08630

* The tube size at the holder is 1/16 inch O.D. × 0.18 mm I.D. × 30 mm length.

Installation



GL Cart

GL Cart guard column are designed as economical type to protect your expensive analytical column. GL Cart is one dimension 5 mm × 4.6 mm I.D.
(Compatible analytical columns' I.D. is 4.0 mm, 4.6 mm.) GL Cart holder is reusable.

Packing Material	Particle size (μm)	Cartridge guard column GL Cart 10 pcs (5 × 4.6 mm I.D.)	GL Cart Set (5 GL Cart cartridge + 1 holder)
		Cat. No.	Cat. No.
InertSustain C18	3	5020-20146	5020-20246
	5	5020-20145	5020-20245
InertSustain AQ-C18	3	5020-89918	5020-89919
	5	5020-89822	5020-89823
InertSustainSwift C18	3	5020-88207	5020-88208
	5	5020-88121	5020-88122
Inertsil ODS-HL	3	5020-87313	5020-87314
	5	5020-87223	5020-87224
Inertsil ODS-4	3	5020-20102	5020-20202
	5	5020-20101	5020-20201
Inertsil ODS-3	3	5020-20105	5020-20205
	4	5020-20104	5020-20204
	5	5020-20103	5020-20203
Inertsil ODS-2	5	5020-20135	5020-20235
Inertsil ODS-SP	3	5020-20107	5020-20207
	5	5020-20106	5020-20206
Inertsil ODS-P	3	5020-20109	5020-20209
	5	5020-20108	5020-20208
Inertsil ODS-EP	5	5020-20110	5020-20210
InertSustain C8	3	5020-16215	5020-16216
	5	5020-16122	5020-16123
InertSustainSwift C8	3	5020-88513	5020-88514
	5	5020-88423	5020-88424
Inertsil C8-4	3	5020-20144	5020-20244
	5	5020-20143	5020-20243
Inertsil C8-3	3	5020-20115	5020-20215
	5	5020-20114	5020-20214
InertSustain PFP	3	5020-87915	5020-87916
	5	5020-87919	5020-87918
InertSustain Phenylhexyl	3	5020-89207	5020-89208
	5	5020-89121	5020-89122
InertSustain Phenyl	3	5020-16515	5020-16516
	5	5020-16422	5020-16423
Inertsil Ph-3	3	5020-20117	5020-20217
	5	5020-20116	5020-20216
InertSustain Cyano	3	5020-89457	5020-89458
	5	5020-89371	5020-89372
Inertsil CN-3	3	5020-20119	5020-20219
	5	5020-20118	5020-20218
Inertsil WP300 C18	5	5020-20128	5020-20228
Inertsil WP300 C8	5	5020-20129	5020-20229
Inertsil WP300 C4	5	5020-20130	5020-20230
InertSustain Amide	3	5020-88813	5020-88814
	5	5020-88723	5020-88724
Inertsil Amide	3	5020-20190	5020-20248
	5	5020-20189	5020-20247
Inertsil HILIC	3	5020-20125	5020-20225
	5	5020-20124	5020-20224
InertSustain NH2	3	5020-16815	5020-16816
	5	5020-16722	5020-16723
Inertsil NH2	3	5020-20121	5020-20221
	5	5020-20120	5020-20220
Inertsil Diol	3	5020-20123	5020-20223
	5	5020-20122	5020-20222
Inertsil SIL-100A	3	5020-20127	5020-20227
	5	5020-20126	5020-20226
Inertsil SIL-150A	5	5020-20139	5020-20239
Inertsil WP300 SIL	5	5020-20132	5020-20232
Inertsil WP300 Diol	5	5020-20131	5020-20231

Packed Guard Columns, Packed Mini Guard Columns



Packed Guard Column

Packed Mini Guard Column

Packed guard column and Mini guard column are designed different with cartridges' type, using a high pressure to pack it as a guard column, and also can sustain analytical column's performance.

Packed guard column has length 33 mm and 50 mm two types, and Mini guard column has length 10 mm.

Packed Guard Columns

Packing Material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
InertSustain C18	1.0	5020-15996	5020-15995	5020-15896	5020-15895
	1.5	5020-15946	5020-15945	5020-15846	5020-15845
	2.1	5020-04896	5020-04895	5020-03596	5020-03595
	3.0	5020-04496	5020-04495	5020-03496	5020-03495
	4.0	5020-04296	5020-04295	5020-03396	5020-03395
	4.6	5020-04196	5020-04195	5020-03296	5020-03295
InertSustain AQ-C18	1.0	5020-89886	5020-89756	5020-89884	5020-89754
	1.5	5020-89885	5020-89755	5020-89883	5020-89753
	2.1	5020-89870	5020-89740	5020-89865	5020-89735
	3.0	5020-89869	5020-89739	5020-89864	5020-89734
	4.0	5020-89868	5020-89738	5020-89863	5020-89733
	4.6	5020-89867	5020-89737	5020-89862	5020-89732
InertSustainSwift C18	1.0	5020-88175	5020-88053	5020-88173	5020-88051
	1.5	5020-88174	5020-88052	5020-88172	5020-88050
	2.1	5020-88159	5020-88037	5020-88154	5020-88032
	3.0	5020-88158	5020-88036	5020-88153	5020-88031
	4.0	5020-88157	5020-88035	5020-88152	5020-88030
	4.6	5020-88156	5020-88034	5020-88151	5020-88029
Inertsil ODS-HL	1.0	5020-87281	5020-87157	5020-87279	5020-87155
	1.5	5020-87280	5020-87156	5020-87278	5020-87154
	2.1	5020-87265	5020-87141	5020-87260	5020-87136
	3.0	5020-87264	5020-87140	5020-87259	5020-87135
	4.0	5020-87263	5020-87139	5020-87258	5020-87134
	4.6	5020-87262	5020-87138	5020-87257	5020-87133
Inertsil ODS-4	1.0	5020-15952	5020-15951	5020-15852	5020-15851
	1.5	5020-15902	5020-15901	5020-15802	5020-15801
	2.1	5020-04852	5020-04851	5020-03552	5020-03551
	3.0	5020-04452	5020-04451	5020-03452	5020-03451
	4.0	5020-04252	5020-04251	5020-03352	5020-03351
	4.6	5020-04152	5020-04151	5020-03252	5020-03251
Inertsil ODS-3	1.0	5020-15955	5020-15953	5020-15855	5020-15853
	1.5	5020-15905	5020-15903	5020-15805	5020-15803
	2.1	5020-04855	5020-04853	5020-03555	5020-03553
	3.0	5020-04455	5020-04453	5020-03455	5020-03453
	4.0	5020-04255	5020-04253	5020-03355	5020-03353
	4.6	5020-04155	5020-04153	5020-03255	5020-03253
Inertsil ODS-2	1.0	—	5020-15985	—	5020-15885
	1.5	—	5020-15935	—	5020-15835
	2.1	—	5020-04885	—	5020-03585
	3.0	—	5020-04485	—	5020-03485
	4.0	—	5020-04285	—	5020-03385
	4.6	—	5020-04185	—	5020-03285
Inertsil ODS-SP	1.0	5020-15957	5020-15956	5020-15857	5020-15856
	1.5	5020-15907	5020-15906	5020-15807	5020-15806
	2.1	5020-04857	5020-04856	5020-03557	5020-03556
	3.0	5020-04457	5020-04456	5020-03457	5020-03456
	4.0	5020-04257	5020-04256	5020-03357	5020-03356
	4.6	5020-04157	5020-04156	5020-03257	5020-03256

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Packed Guard Columns, Packed Mini Guard Columns

Packed Guard Columns

Packing Material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
Inertsil ODS-P	1.0	5020-15959	5020-15958	5020-15859	5020-15858
	1.5	5020-15909	5020-15908	5020-15809	5020-15808
	2.1	5020-04859	5020-04858	5020-03559	5020-03558
	3.0	5020-04459	5020-04458	5020-03459	5020-03458
	4.0	5020-04259	5020-04258	5020-03359	5020-03358
	4.6	5020-04159	5020-04158	5020-03259	5020-03258
Inertsil ODS-EP	1.0	–	5020-15960	–	5020-15860
	1.5	–	5020-15910	–	5020-15810
	2.1	–	5020-04860	–	5020-03560
	3.0	–	5020-04460	–	5020-03460
	4.0	–	5020-04260	–	5020-03360
	4.6	–	5020-04160	–	5020-03260
InertSustain C8	1.0	5020-16183	5020-16054	5020-16181	5020-16052
	1.5	5020-16182	5020-16053	5020-16180	5020-16051
	2.1	5020-16167	5020-16038	5020-16162	5020-16033
	3.0	5020-16166	5020-16037	5020-16161	5020-16032
	4.0	5020-16165	5020-16036	5020-16160	5020-16031
	4.6	5020-16164	5020-16035	5020-16159	5020-16030
InertSustainSwift C8	1.0	5020-88481	5020-88357	5020-88479	5020-88355
	1.5	5020-88480	5020-88356	5020-88478	5020-88354
	2.1	5020-88465	5020-88341	5020-88460	5020-88336
	3.0	5020-88464	5020-88340	5020-88459	5020-88335
	4.0	5020-88463	5020-88339	5020-88458	5020-88334
	4.6	5020-88462	5020-88338	5020-88457	5020-88333
Inertsil C8-4	1.0	5020-15994	5020-15993	5020-15894	5020-15893
	1.5	5020-15944	5020-15943	5020-15844	5020-15843
	2.1	5020-04894	5020-04893	5020-03594	5020-03593
	3.0	5020-04494	5020-04493	5020-03494	5020-03493
	4.0	5020-04294	5020-04293	5020-03394	5020-03393
	4.6	5020-04194	5020-04193	5020-03294	5020-03293
Inertsil C8-3	1.0	5020-15965	5020-15964	5020-15865	5020-15864
	1.5	5020-15915	5020-15914	5020-15815	5020-15814
	2.1	5020-04865	5020-04864	5020-03565	5020-03564
	3.0	5020-04465	5020-04464	5020-03465	5020-03464
	4.0	5020-04265	5020-04264	5020-03365	5020-03364
	4.6	5020-04165	5020-04164	5020-03265	5020-03264
Inertsil C8	1.0	–	5020-15986	–	5020-15886
	1.5	–	5020-15936	–	5020-15836
	2.1	–	5020-04886	–	5020-03586
	3.0	–	5020-04486	–	5020-03486
	4.0	–	5020-04286	–	5020-03386
	4.6	–	5020-04186	–	5020-03286
Inertsil C4	1.0	–	5020-15988	–	5020-15888
	1.5	–	5020-15938	–	5020-15838
	2.1	–	5020-04888	–	5020-03588
	3.0	–	5020-04488	–	5020-03488
	4.0	–	5020-04288	–	5020-03388
	4.6	–	5020-04188	–	5020-03288
InertSustain PFP	1.0	5020-87883	5020-87756	5020-87881	5020-87754
	1.5	5020-87882	5020-87755	5020-87880	5020-87753
	2.1	5020-87867	5020-87740	5020-87862	5020-87735
	3.0	5020-87866	5020-87739	5020-87861	5020-87734
	4.0	5020-87865	5020-87738	5020-87860	5020-87733
	4.6	5020-87864	5020-87737	5020-87859	5020-87732
InertSustain Phenylhexyl	1.0	5020-89175	5020-89053	5020-89173	5020-89051
	1.5	5020-89174	5020-89052	5020-89172	5020-89050
	2.1	5020-89159	5020-89037	5020-89154	5020-89032
	3.0	5020-89158	5020-89036	5020-89153	5020-89031
	4.0	5020-89157	5020-89035	5020-89152	5020-89030
	4.6	5020-89156	5020-89034	5020-89151	5020-89029

Packed Guard Columns

Packing Material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
InertSustain Phenyl	1.0	5020-16483	5020-16354	5020-16481	5020-16352
	1.5	5020-16482	5020-16353	5020-16480	5020-16351
	2.1	5020-16467	5020-16338	5020-16462	5020-16333
	3.0	5020-16466	5020-16337	5020-16461	5020-16332
	4.0	5020-16465	5020-16336	5020-16460	5020-16331
	4.6	5020-16464	5020-16335	5020-16459	5020-16330
Inertsil Ph-3	1.0	5020-15967	5020-15966	5020-15867	5020-15866
	1.5	5020-15917	5020-15916	5020-15817	5020-15816
	2.1	5020-04867	5020-04866	5020-03567	5020-03566
	3.0	5020-04467	5020-04466	5020-03467	5020-03466
	4.0	5020-04267	5020-04266	5020-03367	5020-03366
	4.6	5020-04167	5020-04166	5020-03267	5020-03266
Inertsil Ph	1.0	–	5020-15987	–	5020-15887
	1.5	–	5020-15937	–	5020-15837
	2.1	–	5020-04887	–	5020-03587
	3.0	–	5020-04487	–	5020-03487
	4.0	–	5020-04287	–	5020-03387
	4.6	–	5020-04187	–	5020-03287
InertSustain Cyano	1.0	5020-89425	5020-89303	5020-89423	5020-89301
	1.5	5020-89424	5020-89302	5020-89422	5020-89300
	3.0	5020-89408	5020-89287	5020-89403	5020-89282
	4.0	5020-89407	5020-89285	5020-89402	5020-89280
	4.6	5020-89406	5020-89284	5020-89401	5020-89279
Inertsil CN-3	1.0	5020-15969	5020-15968	5020-15869	5020-15868
	1.5	5020-15919	5020-15918	5020-15819	5020-15818
	2.1	5020-04869	5020-04868	5020-03569	5020-03568
	3.0	5020-04469	5020-04468	5020-03469	5020-03468
	4.0	5020-04269	5020-04268	5020-03369	5020-03368
	4.6	5020-04169	5020-04168	5020-03269	5020-03268
Inertsil WP300 C18	1.0	–	5020-15978	–	5020-15878
	1.5	–	5020-15928	–	5020-15828
	2.1	–	5020-04878	–	5020-03578
	3.0	–	5020-04478	–	5020-03478
	4.0	–	5020-04278	–	5020-03378
	4.6	–	5020-04178	–	5020-03278
Inertsil WP300 C8	1.0	–	5020-15979	–	5020-15879
	1.5	–	5020-15929	–	5020-15829
	2.1	–	5020-04879	–	5020-03579
	3.0	–	5020-04479	–	5020-03479
	4.0	–	5020-04279	–	5020-03379
	4.6	–	5020-04179	–	5020-03279
Inertsil WP300 C4	1.0	–	5020-15980	–	5020-15880
	1.5	–	5020-15930	–	5020-15830
	2.1	–	5020-04880	–	5020-03580
	3.0	–	5020-04480	–	5020-03480
	4.0	–	5020-04280	–	5020-03380
	4.6	–	5020-04180	–	5020-03280
InertSustain Amide	1.0	5020-88781	5020-88657	5020-88779	5020-88655
	1.5	5020-88780	5020-88656	5020-88778	5020-88654
	2.1	5020-88765	5020-88641	5020-88760	5020-88636
	3.0	5020-88764	5020-88640	5020-88759	5020-88635
	4.0	5020-88763	5020-88639	5020-88758	5020-88634
	4.6	5020-88762	5020-88638	5020-88757	5020-88633
Inertsil Amide	1.0	5020-15998	5020-15997	5020-15898	5020-15897
	1.5	5020-15948	5020-15947	5020-15848	5020-15847
	2.1	5020-04898	5020-04897	5020-03598	5020-03597
	3.0	5020-04498	5020-04497	5020-03498	5020-03497
	4.0	5020-04298	5020-04297	5020-03398	5020-03397
	4.6	5020-04198	5020-04197	5020-03298	5020-03297

Packed Guard Columns, Packed Mini Guard Columns

Packed Guard Columns

Packing Material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
Inertsil HILIC	1.0	5020-15975	5020-15974	5020-15875	5020-15874
	1.5	5020-15925	5020-15924	5020-15825	5020-15824
	2.1	5020-04875	5020-04874	5020-03575	5020-03574
	3.0	5020-04475	5020-04474	5020-03475	5020-03474
	4.0	5020-04275	5020-04274	5020-03375	5020-03374
	4.6	5020-04175	5020-04174	5020-03275	5020-03274
InertSustain NH2	1.0	5020-16783	5020-16654	5020-16781	5020-16652
	1.5	5020-16782	5020-16653	5020-16780	5020-16651
	2.1	5020-16767	5020-16638	5020-16762	5020-16633
	3.0	5020-16766	5020-16637	5020-16761	5020-16632
	4.0	5020-16765	5020-16634	5020-16760	5020-16631
	4.6	5020-16764	5020-16635	5020-16759	5020-16630
Inertsil NH2	1.0	5020-15971	5020-15970	5020-15871	5020-15870
	1.5	5020-15921	5020-15920	5020-15821	5020-15820
	2.1	5020-04871	5020-04870	5020-03571	5020-03570
	3.0	5020-04471	5020-04470	5020-03471	5020-03470
	4.0	5020-04271	5020-04270	5020-03371	5020-03370
	4.6	5020-04171	5020-04170	5020-03271	5020-03270
Inertsil Diol	1.0	5020-15973	5020-15972	5020-15873	5020-15872
	1.5	5020-15923	5020-15922	5020-15823	5020-15822
	2.1	5020-04873	5020-04872	5020-03573	5020-03572
	3.0	5020-04473	5020-04472	5020-03473	5020-03472
	4.0	5020-04273	5020-04272	5020-03373	5020-03372
	4.6	5020-04173	5020-04172	5020-03273	5020-03272
Inertsil SIL-100A	1.0	5020-15977	5020-15976	5020-15877	5020-15876
	1.5	5020-15927	5020-15926	5020-15827	5020-15826
	2.1	5020-04877	5020-04876	5020-03577	5020-03576
	3.0	5020-04477	5020-04476	5020-03477	5020-03476
	4.0	5020-04277	5020-04276	5020-03377	5020-03376
	4.6	5020-04177	5020-04176	5020-03277	5020-03276
Inertsil SIL-150A	1.0	–	5020-15989	–	5020-15889
	1.5	–	5020-15939	–	5020-15839
	2.1	–	5020-04889	–	5020-03589
	3.0	–	5020-04489	–	5020-03489
	4.0	–	5020-04289	–	5020-03389
	4.6	–	5020-04189	–	5020-03289
Inertsil WP300 SIL	1.0	–	5020-15982	–	5020-15882
	1.5	–	5020-15932	–	5020-15832
	2.1	–	5020-04882	–	5020-03582
	3.0	–	5020-04482	–	5020-03482
	4.0	–	5020-04282	–	5020-03382
	4.6	–	5020-04182	–	5020-03282
Inertsil WP300 Diol	1.0	–	5020-15981	–	5020-15881
	1.5	–	5020-15931	–	5020-15831
	2.1	–	5020-04881	–	5020-03581
	3.0	–	5020-04481	–	5020-03481
	4.0	–	5020-04281	–	5020-03381
	4.6	–	5020-04181	–	5020-03281

* Other packing materials are on request.

Packed Mini Guard Columns

Packing Material	Particle Size (µm)	I.D. (mm)	Length (mm)	Cat. No.
InertSustain C18	3	4.0	10	5020-03696
	5	4.0	10	5020-03695
InertSustain AQ-C18	3	4.0	10	5020-89866
	5	4.0	10	5020-89736
InertSustainSwift C18	3	4.0	10	5020-88155
	5	4.0	10	5020-88033
Inertsil ODS-HL	3	4.0	10	5020-87261
	5	4.0	10	5020-87137
Inertsil ODS-4	3	4.0	10	5020-03652
	5	4.0	10	5020-03651
Inertsil ODS-3	3	4.0	10	5020-03655
	4	4.0	10	5020-03654
	5	4.0	10	5020-03653
Inertsil ODS-2	5	4.0	10	5020-03685
Inertsil ODS-SP	3	4.0	10	5020-03657
	5	4.0	10	5020-03656
Inertsil ODS-P	3	4.0	10	5020-03659
	5	4.0	10	5020-03658
Inertsil ODS-EP	5	4.0	10	5020-03660
Inertsil ODS-80A	5	4.0	10	5020-03690
InertSustain C8	3	4.0	10	5020-16163
	5	4.0	10	5020-16034
InertSustainSwift C8	3	4.0	10	5020-88461
	5	4.0	10	5020-88337
Inertsil C8-4	3	4.0	10	5020-03694
	5	4.0	10	5020-03693
Inertsil C8-3	3	4.0	10	5020-03665
	5	4.0	10	5020-03664
Inertsil C8	5	4.0	10	5020-03686
Inertsil C4	5	4.0	10	5020-03688
InertSustain PFP	3	4.0	10	5020-87863
	5	4.0	10	5020-87736
InertSustain Phenylhexyl	3	4.0	10	5020-89155
	5	4.0	10	5020-89033
InertSustain Phenyl	3	4.0	10	5020-16463
	5	4.0	10	5020-16334
Inertsil Ph-3	3	4.0	10	5020-03667
	5	4.0	10	5020-03666
Inertsil Ph	5	4.0	10	5020-03687
InertSustain Cyano	3	4.0	10	5020-89405
	5	4.0	10	5020-89283
Inertsil CN-3	3	4.0	10	5020-03669
	5	4.0	10	5020-03668
Inertsil WP300 C18	5	4.0	10	5020-03678
Inertsil WP300 C8	5	4.0	10	5020-03679
Inertsil WP300 C4	5	4.0	10	5020-03680
InertSustain Amide	3	4.0	10	5020-88761
	5	4.0	10	5020-88637
Inertsil Amide	3	4.0	10	5020-03698
	5	4.0	10	5020-03697
Inertsil HILIC	3	4.0	10	5020-03675
	5	4.0	10	5020-03674
InertSustain NH2	3	4.0	10	5020-16763
	5	4.0	10	5020-16634
Inertsil NH2	3	4.0	10	5020-03671
	5	4.0	10	5020-03670
Inertsil Diol	3	4.0	10	5020-03673
	5	4.0	10	5020-03672
Inertsil SIL-100A	3	4.0	10	5020-03677
	5	4.0	10	5020-03676
Inertsil SIL-150A	5	4.0	10	5020-03689
Inertsil WP300 SIL	5	4.0	10	5020-03682
Inertsil WP300 Diol	5	4.0	10	5020-03681

* Other packing materials are on request.

SILFILTER STD C18

SILFILTER STD C18 is a guard column with cartridge size 3.0 mm I.D. × 10 mm. The cartridge is packed with a monolithic silica, chemically bonded with a C18 and uniquely end-capped based on our 45 years of experience. SILFILTER STD C18 can be installed and used for all C18 columns available in the market without interfering and influencing the elution or separation patterns. Also, deterioration of the packing in the cartridge can be confirmed visually.

• Feature

- Can be installed for all C18 columns available in the market.
- Deterioration of the packing in the cartridge can be confirmed visually.
- Easy to replace the cartridges.
- Effectively removes particulate and strongly retained sample compounds
- Delivers the lowest dead-volume.

• Specification

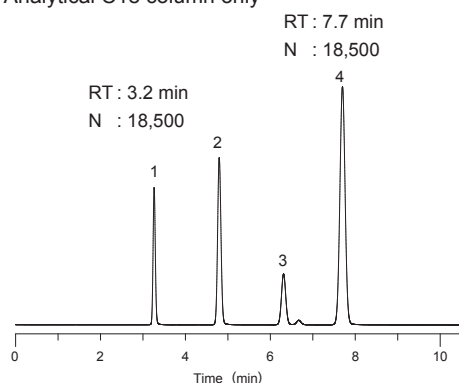
- Base Material : High Purity Monolithic Silica
- Max. Operating Pressure : 35 MPa (350 bar)
- Bonded Phase : Octadecyl Groups
- Size : 10 × 3.0 mm I.D.
- End-capping : Yes
- pH Range : 1 - 7.5
- Max. Temperature : 50 °C
- Compatible analytical Columns' I.D. : 3.0 - 4.6 mm I.D.

No Sacrifice in Separation Efficiency

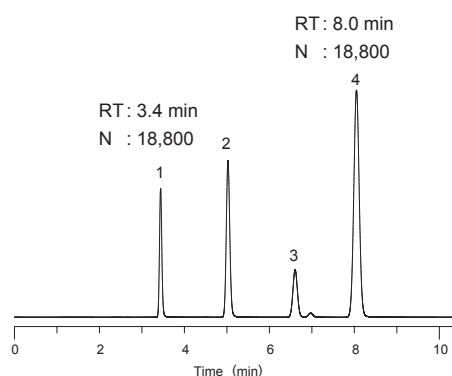
The following test was conducted to confirm the efficiency of SILFILTER STD C18.

As shown below, the efficiency didn't decrease even for those fast eluting samples when installing SILFILTER STD C18.

Analytical C18 column only

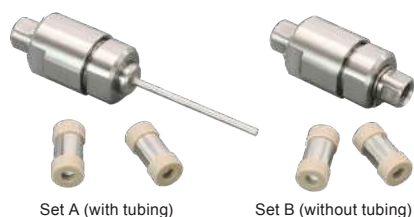


With SILFILTER STD C18



Conditions

Column : C18 Column
(3 μm, 150 × 3.0 mm I.D.)
Eluent : A) CH₃CN
B) H₂O
A/B = 65/35, v/v
Flow Rate : 0.4 mL/min
Col. Temp.: 40 °C
Detection : UV 254 nm
Sample : 1. Acetaminophen
2. Benzene
3. Toluene
4. Naphthalene



Item	Cat.No.
SILFILTER STD C18, Set A* ¹ 2 Cartridges with 1 Holder and tubing	5020-10404
SILFILTER STD C18, Set B * ² 2 Cartridges with 1 Holder, without tubing	5020-10405
SILFILTER(with tubing) Holder for A type* ¹	5020-10402
SILFILTER(without tubing) Holder for B type* ²	5020-10403
Replaceable Cartridge, 2 pcs	5020-10401
PEEK Tough Connector, 5 pcs	6010-48600

* 1: Tubing size is, 1/16 inch O.D. × 0.18 mm I.D. × 30 mm

* 2: Tubing tip length is 2.4 mm

Filters, Impurity Remove Columns

Pre-Column Coupler



Pre-column Coupler (PCTFE)



Pre-column Coupler SUS

Pre-column Coupler is an easy-to-use tool to connect guard columns and analytical columns. Pre-column Coupler has two designs, one is using PCTFE material, except common organic solvents, acidic solvent and basic solvent also can be used. And another one is stainless design, it can be used under high pressure.

• Specification

Max. operating pressure : PCTFE : 14.7 MPa (147 bar), SUS : 80 MPa (800 bar)

Tube O.D. : 1/16 inch

Length : 29.2 mm (UP type), 32 mm (W type), 40 mm (SUS type)

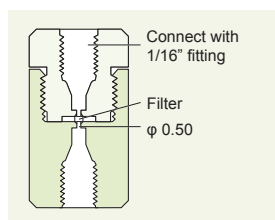
Item	I.D.	Material	Connection	Cat.No.
Pre-column Coupler UP	0.18 mm	PCTFE	Paker type (UP type)	6010-49200
	0.25 mm			6010-49201
	0.50 mm			6010-49202
Pre-column Coupler W	0.25 mm	PCTFE	Waters type	6010-49251
	0.50 mm			6010-49211
Pre-column Coupler SUS	0.10 mm	SUS	—*	6010-49210
	0.25 mm			6010-49250

* Product Pre-column Coupler SUS does not fixed with Ferrules, therefore columns with 10-32UNF specification all can be used.

Pre-Column Filter



Pre-column filter



• Specification

Fit in tube O.D. : 1/16 inch

Screw specification : 10-32UNF

Filter pore size : 2 μm

Max. operating pressure : SUS : 41.4 MPa (414 bar), PEEK : 34.5 MPa (345 bar)

Item	Jacket Material	P/N	Qty. (pc)	Cat.No.
Pre-column filter 2 μm	Stainless	A-315	1	6010-55100
Replacement pre-column filter 2 μm	—	A-101	1	6010-55110
PEEK pre-column filter 2 μm	PEEK	A-355	1	6010-55300
Replacement PEEK pre-column filter 2 μm	—	A-700	1	6010-55310

Pre-Clean ORG



Pre-clean ORG

- A guard column to install between the pump and injector, to remove the impurity in aqueous organic eluent.
- Protect analytical LC columns, and prolong analytical columns lifetime.
- Easy-to-replace.
- Also can be used as an in-line filter, semimicro columns are most appropriate for column clog.
- 2 types for two different flow rates.

Item	I.D. (mm)	Length (mm)	Recommend Flow Rate (mL/min)	Cat.No.
Pre-clean ORG replacement cartridge 2ea	7.6	30	1.0~20 mL/min	5020-12755
Pre-clean ORG holder and cartridge x2ea	7.6	30	1.0~20 mL/min	5020-12760
Pre-clean ORG holder	—	—	—	5020-12750
Pre-clean ORG semi replacement cartridge 2ea	4.0	10	0.1~2.0 mL/min	5020-12780
Pre-clean ORG semi holder and cartridge x2ea	4.0	10	0.1~2.0 mL/min	5020-12790
Pre-clean ORG semi holder	—	—	—	5020-12770



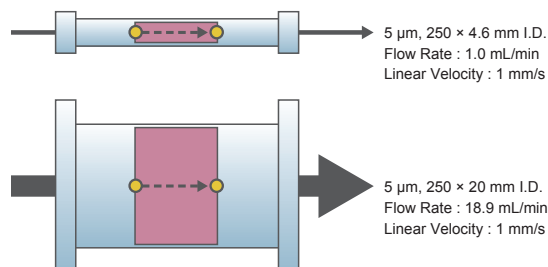
Preparative Columns

•Choosing Preparative Columns	130
•Preparative Columns.....	131
•Guard Columns for Preparative Columns	136
•PREP Guard Cartridges	139

Choosing Preparative Columns

Relationship between Column I.D. , Sample Loading Volume and Flow Rate

In preparative operations, column internal diameter sizes from 6.0 to 100 mm are widely used. When the analytical conditions along with the column packing material and length were the same between the analytical and preparative run, nearly the same chromatograms can be achieved by simply adjusting the flow rate and sample loading volume in proportion to the column cross-section area. The following table illustrates the appropriate flow rate against each column internal diameter sizes.



Column I.D. (mm)	Scale-Up Factor	Appropriate Flow Rate (mL/min)* ¹				Remarks
		Reversed/Normal Phases	SEC	HILIC	Chiral	
4.6	1	1	0.2 - 0.3	0.5	1	Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns.
6.0	1.7	1.7	0.3 - 0.5	0.8	1.7	Semi-preparative HPLC columns can be used in standard HPLC systems. Column I.D. sizes from 7.6-8.0 mm are generally used when scaling-up in SEC.
7.6 - 8.0	2.7	2.7	0.5 - 1.0	1.4	2.7	
10	5	5	1.0 - 1.5	2.4	5	
14	9	9	1.8 - 2.5	4.6	–	
20	19	19	3.8 - 5.4	9.5	19	Column I.D. sizes dominantly used in preparative HPLC researches. Dedicated preparative HPLC systems are required as a wide flow rate range is required.
30	43	43	9.0 - 14	21	45	
50	120	120	24 - 36	60	50* ³	
100	470	235* ²	47 - 71* ²	120* ²	200* ³	

* 1 : When the particle size of the packing material is a 5 µm.

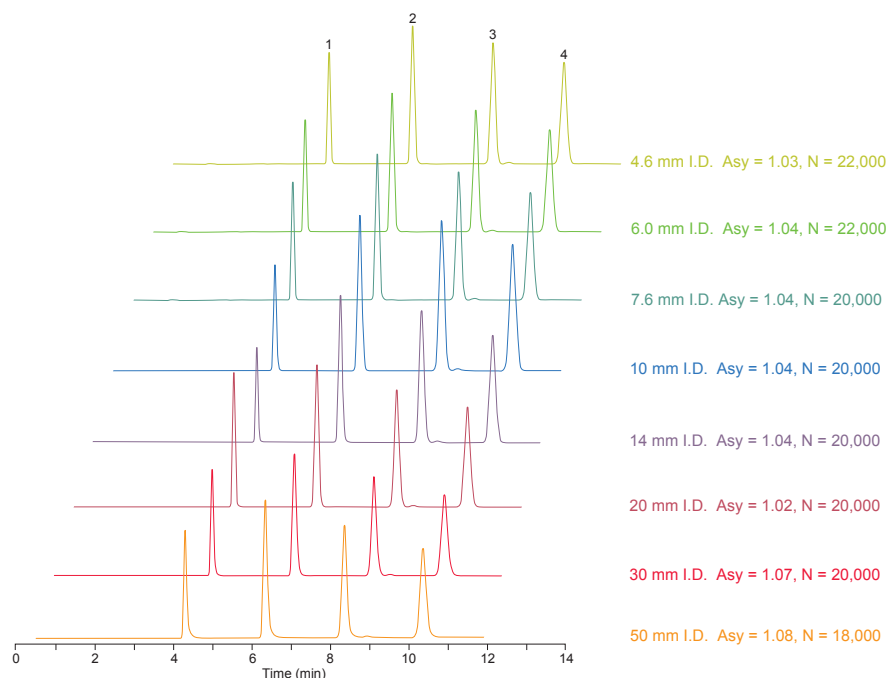
* 2 : When the particle size of the packing material is a 10 µm.

* 3 : When the particle size of the packing material is a 20 µm.

Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

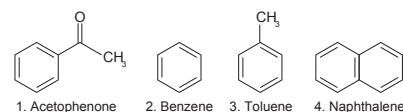
Generally, analytical scale columns are used initially to determine and optimize separation conditions between the target peak and unwanted contaminants with various bonded phases. Efficient scale-up of methods from analytical to preparative dimensions requires the use of a packing material offering identical selectivity, otherwise methods would not scale as expected.

InertSustain and Inertsil preparative HPLC columns offer asymmetry factor of nearly 1.0 delivering symmetric peaks maintaining efficiency of approximately 20,000 (N) when the column length is a 250 mm. As shown below, the scalability of InertSustain and Inertsil preparative HPLC columns provides smooth, easy and highly efficient purification and isolation results.



Conditions

System : PLC 761 System
Column : Inertsil ODS-3 (5 µm, 250 mm)
Eluent : A) CH₃CN
 B) H₂O
 A/B = 65/35, v/v
Flow Rate : Linear Velocity at 1 mm/s
Col. Temp. : 40 °C
Col. Pres. : Approx. 5.0 MPa (50 bar)
Detection : UV 254 nm
Sample : 1. Acetophenone
 2. Benzene
 3. Toluene
 4. Naphthalene



Preparative Columns



Preparative Columns

InertSustain and Inertsil preparative columns are available in a broad range of column sizes to answer and meet all demands in preparative chromatography.

Phase Particle Size	Length (mm)	50	100	150	250
	I.D. (mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
InertSustain C18 5 µm	6.0	5020-07352	5020-07354	5020-07355	5020-07356
	7.6	5020-07362	5020-07364	5020-07365	5020-07366
	10	5020-14252	5020-14254	5020-14255	5020-14256
	14	5020-14262	5020-14264	5020-14265	5020-14266
	20	5020-14272	5020-14274	5020-14275	5020-14276
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
InertSustain AQ-C18 5 µm	6.0	5020-89757	5020-89758	5020-89759	5020-89760
	7.6	5020-89761	5020-89762	5020-89763	5020-89764
	10	5020-89765	5020-89766	5020-89767	5020-89768
	14	5020-89769	5020-89770	5020-89771	5020-89772
	20	5020-89773	5020-89774	5020-89775	5020-89776
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
InertSustainSwift C18 5 µm	6.0	5020-88054	5020-88055	5020-88056	5020-88057
	7.6	5020-88058	5020-88059	5020-88060	5020-88061
	10	5020-88062	5020-88063	5020-88064	5020-88065
	14	5020-88066	5020-88067	5020-88068	5020-88069
	20	5020-88070	5020-88071	5020-88072	5020-88073
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
Inertsil ODS-HL 5 µm	6.0	5020-87158	5020-87159	5020-87160	5020-87161
	7.6	5020-87162	5020-87163	5020-87164	5020-87165
	10	5020-87166	5020-87167	5020-87168	5020-87169
	14	5020-87170	5020-87171	5020-87172	5020-87173
	20	5020-87174	5020-87175	5020-87176	5020-87177
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
Inertsil ODS-4 5 µm	6.0	5020-03953	5020-03954	5020-03955	5020-03956
	7.6	5020-03963	5020-03964	5020-03965	5020-03966
	10	5020-81053	5020-81054	5020-81055	5020-81056
	14	5020-79001	5020-79002	5020-79003	5020-79004
	20	5020-81063	5020-81064	5020-81065	5020-81066
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
Inertsil ODS-3 5 µm	6.0	5020-07011	5020-04554	5020-01733	5020-01734
	7.6	5020-07012	5020-06803	5020-06804	5020-06802
	10	5020-07013	5020-06813	5020-06814	5020-06812
	14	5020-79011	5020-79012	5020-79013	5020-79014
	20	5020-07014	5020-06823	5020-06824	5020-06822
	30	5020-07015	5020-06833	5020-06834	5020-06832
	50	-	5020-	5020-	5020-06852
	100	-	5020-	5020-	5020-
Inertsil ODS-3 10 µm	10	5020-79100	5020-79101	5020-79102	5020-79103
	14	5020-79105	5020-79106	5020-79107	5020-79108
	20	5020-79110	5020-79111	5020-79112	5020-79113
	30	5020-79115	5020-79116	5020-79117	5020-79118
	50	-	5020-	5020-	5020-79120
	100	-	5020-	5020-	5020-

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Preparative Columns

Phase Particle Size	Length (mm)	50	100	150	250
	I.D. (mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil ODS-SP 5 µm	6.0	5020-02752	5020-02754	5020-02755	5020-02756
	7.6	5020-02762	5020-02764	5020-02765	5020-02766
	10	5020-85252	5020-85254	5020-85255	5020-85256
	14	5020-79016	5020-79017	5020-79018	5020-79019
	20	5020-85262	5020-85264	5020-85265	5020-85266
Inertsil ODS-P 5 µm	6.0	5020-04752	5020-04754	5020-04755	5020-04756
	7.6	5020-04762	5020-04764	5020-04765	5020-04766
	10	5020-84752	5020-84754	5020-84755	5020-84756
	14	5020-79026	5020-79027	5020-79028	5020-79029
	20	5020-84762	5020-84764	5020-84765	5020-84766
	30	5020-84772	5020-	5020-	5020-84776
	50	–	5020-	5020-	5020-84786
Inertsil ODS-EP 5 µm	6.0	5020-02652	5020-02654	5020-02655	5020-02656
	7.6	5020-02662	5020-02664	5020-02665	5020-02666
	10	5020-18252	5020-18254	5020-18255	5020-18256
	14	5020-79021	5020-79022	5020-79023	5020-79024
	20	5020-18262	5020-18264	5020-18265	5020-18266
	30	5020-18272	5020-	5020-	5020-18276
	50	–	5020-	5020-	5020-18286
Inertsil ODS-80A 5 µm	6.0	5020-	5020-	5020-01603	5020-01604
	7.6	5020-	5020-	5020-	5020-06146
	10	5020-	5020-	5020-	5020-15616
	20	5020-	5020-	5020-	5020-15646
Inertsil ODS-2 5 µm	6.0	5020-	5020-	5020-01103	5020-01104
	7.6	5020-	5020-	5020-	5020-06142
	10	5020-	5020-	5020-	5020-15612
	20	5020-	5020-	5020-	5020-15642
Inertsil ODS 5 µm	6.0	5020-	5020-	5020-02103	5020-02104
	7.6	5020-31501	5020-	5020-	5020-31503
	10	5020-31511	5020-	5020-	5020-31513
	20	5020-31521	5020-	5020-	5020-31523
Inertsil ODS 10 µm	6.0	5020-	5020-	5020-02203	5020-02204
	7.6	5020-31601	5020-	5020-	5020-31603
	10	5020-31611	5020-	5020-	5020-31613
	20	5020-31621	5020-	5020-	5020-31623
InertSustain C8 5 µm	6.0	5020-16055	5020-16056	5020-16057	5020-16058
	7.6	5020-16059	5020-16060	5020-16061	5020-16062
	10	5020-16063	5020-16064	5020-16065	5020-16066
	14	5020-16067	5020-16068	5020-16069	5020-16070
	20	5020-16071	5020-16072	5020-16073	5020-16074
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
InertSustainSwift C8 5 µm	6.0	5020-88358	5020-88359	5020-88360	5020-88361
	7.6	5020-88362	5020-88363	5020-88364	5020-88365
	10	5020-88366	5020-88367	5020-88368	5020-88369
	14	5020-88370	5020-88371	5020-88372	5020-88373
	20	5020-88374	5020-88375	5020-88376	5020-88377
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
Inertsil C8-4 5 µm	6.0	5020-04087	5020-04088	5020-04089	5020-04090
	7.6	5020-04092	5020-04093	5020-04094	5020-04095
	10	5020-81243	5020-81244	5020-81245	5020-81246
	14	5020-79006	5020-79007	5020-79008	5020-79009
	20	5020-81253	5020-81254	5020-81255	5020-81256
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-

Phase Particle Size	Length (mm)	50	100	150	250
	I.D. (mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil C8-3 5 µm	6.0	5020-04952	5020-04954	5020-04955	5020-04956
	7.6	5020-04962	5020-04964	5020-04965	5020-04966
	10	5020-84952	5020-84954	5020-84955	5020-84956
	14	5020-79031	5020-79032	5020-79033	5020-79034
	20	5020-84962	5020-84964	5020-84965	5020-84966
	30	5020-84972	5020-	5020-	5020-84976
	50	-	5020-	5020-	5020-84986
	100	-	5020-	5020-	5020-
Inertsil C8-3 10 µm	10	5020-79300	5020-79301	5020-79302	5020-79303
	14	5020-79305	5020-79306	5020-79307	5020-79308
	20	5020-79310	5020-79311	5020-79312	5020-79313
	30	5020-79315	5020-79316	5020-79317	5020-79318
	50	-	5020-	5020-	5020-79320
	100	-	5020-	5020-	5020-
Inertsil C8 5 µm	6.0	5020-	5020-	5020-01203	5020-01204
	7.6	5020-	5020-	5020-	5020-06143
	10	5020-	5020-	5020-	5020-15613
	20	5020-	5020-	5020-	5020-15643
InertSustain Phenylhexyl 5 µm	6.0	5020-89054	5020-89055	5020-89056	5020-89057
	7.6	5020-89058	5020-89059	5020-89060	5020-89061
	10	5020-89062	5020-89063	5020-89064	5020-89065
	14	5020-89066	5020-89067	5020-89068	5020-89069
	20	5020-89070	5020-89071	5020-89072	5020-89073
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
InertSustain PFP 5 µm	6	5020-87757	5020-87758	5020-87759	5020-87760
	7.6	5020-87761	5020-87762	5020-87763	5020-87764
	10	5020-87765	5020-87766	5020-87767	5020-87768
	14	5020-87769	5020-87770	5020-87771	5020-87772
	20	5020-87773	5020-87774	5020-87775	5020-87776
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
InertSustain Phenyl 5 µm	6.0	5020-16355	5020-16356	5020-16357	5020-16358
	7.6	5020-16359	5020-16360	5020-16361	5020-16362
	10	5020-16363	5020-16364	5020-16365	5020-16366
	14	5020-16367	5020-16368	5020-16369	5020-16370
	20	5020-16371	5020-16372	5020-16373	5020-16374
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
Inertsil Ph-3 5 µm	6.0	5020-05152	5020-05154	5020-05155	5020-05156
	7.6	5020-05162	5020-05164	5020-05165	5020-05166
	10	5020-85152	5020-85154	5020-85155	5020-85156
	14	5020-79036	5020-79037	5020-79038	5020-79039
	20	5020-85162	5020-85164	5020-85165	5020-85166
	30	5020-85172	5020-	5020-	5020-85176
	50	-	5020-	5020-	5020-85186
	100	-	5020-	5020-	5020-
InertSustain Cyano	6.0	5020-89304	5020-89305	5020-89306	5020-89307
	7.6	5020-89308	5020-89309	5020-89310	5020-89311
	10	5020-89312	5020-89313	5020-89314	5020-89315
	14	5020-89316	5020-89317	5020-89318	5020-89319
	20	5020-89320	5020-89321	5020-89322	5020-89323
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Preparative Columns

Phase Particle Size	Length (mm)	50	100	150	250
	I.D. (mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil CN-3 5 µm	6.0	5020-05352	5020-05354	5020-05355	5020-05356
	7.6	5020-05362	5020-05364	5020-05365	5020-05366
	10	5020-85352	5020-85354	5020-85355	5020-85356
	14	5020-79041	5020-79042	5020-79043	5020-79044
	20	5020-85362	5020-85364	5020-85365	5020-85366
	30	5020-85372	5020-	5020-	5020-85376
	50	–	5020-	5020-	5020-85386
	100	–	5020-	5020-	5020-
Inertsil WP300 C18 5 µm	6.0	5020-05950	5020-05951	5020-05952	5020-05953
	7.6	5020-05955	5020-05956	5020-05957	5020-05958
	10	5020-85832	5020-85834	5020-85835	5020-85836
	14	5020-79071	5020-79072	5020-79073	5020-79074
	20	5020-85842	5020-85844	5020-85845	5020-85846
	30	5020-85852	5020-	5020-	5020-85856
	50	–	5020-	5020-	5020-85866
	100	–	5020-	5020-	5020-
Inertsil WP300 C8 5 µm	6.0	5020-05960	5020-05961	5020-05962	5020-05963
	7.6	5020-05965	5020-05966	5020-05967	5020-05968
	10	5020-85732	5020-85734	5020-85735	5020-85736
	14	5020-79076	5020-79077	5020-79078	5020-79079
	20	5020-85742	5020-85744	5020-85745	5020-85746
	30	5020-85752	5020-	5020-	5020-85756
	50	–	5020-	5020-	5020-85766
	100	–	5020-	5020-	5020-
Inertsil WP300 C4 5 µm	6.0	5020-05970	5020-05971	5020-05972	5020-05973
	7.6	5020-05975	5020-05976	5020-05977	5020-05978
	10	5020-86132	5020-86134	5020-86135	5020-86136
	14	5020-79081	5020-79082	5020-79083	5020-79084
	20	5020-86142	5020-86144	5020-86145	5020-86146
	30	5020-86152	5020-	5020-	5020-86156
	50	–	5020-	5020-	5020-86166
	100	–	5020-	5020-	5020-
InertSustain Amide 5 µm	6.0	5020-88658	5020-88659	5020-88660	5020-88661
	7.6	5020-88662	5020-88663	5020-88664	5020-88665
	10	5020-88666	5020-88667	5020-88668	5020-88669
	14	5020-88670	5020-88671	5020-88672	5020-88673
	20	5020-88674	5020-88675	5020-88676	5020-88677
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
Inertsil Amide 5 µm	6.0	5020-07842	5020-07844	5020-07845	5020-07846
	7.6	5020-07852	5020-07854	5020-07855	5020-07856
	10	5020-86852	5020-86854	5020-86855	5020-86856
	14	5020-79066	5020-79067	5020-79068	5020-79069
	20	5020-86862	5020-86864	5020-86865	5020-86866
	30	5020-86872	5020-	5020-	5020-86876
	50	–	5020-	5020-	5020-86886
	100	–	5020-	5020-	5020-
Inertsil HILIC 5 µm	6.0	5020-07742	5020-07744	5020-07745	5020-07746
	7.6	5020-07752	5020-07754	5020-07755	5020-07756
	10	5020-86752	5020-86754	5020-86755	5020-86756
	14	5020-79061	5020-79062	5020-79063	5020-79064
	20	5020-86762	5020-86764	5020-86765	5020-86766
	30	5020-86772	5020-	5020-	5020-86776
	50	–	5020-	5020-	5020-86786
	100	–	5020-	5020-	5020-

Phase Particle Size	Length (mm)	50	100	150	250
	I.D. (mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
InertSustain NH2 5 µm	6.0	5020-16655	5020-16656	5020-16657	5020-16658
	7.6	5020-16659	5020-16660	5020-16661	5020-16662
	10	5020-16663	5020-16664	5020-16665	5020-16666
	14	5020-16667	5020-16668	5020-16669	5020-16670
	20	5020-16671	5020-16672	5020-16673	5020-16674
	30	5020-	5020-	5020-	5020-
	50	-	5020-	5020-	5020-
	100	-	5020-	5020-	5020-
Inertsil NH2 5 µm	6.0	5020-05552	5020-05554	5020-05555	5020-05556
	7.6	5020-05562	5020-05564	5020-05565	5020-05566
	10	5020-85552	5020-85554	5020-85555	5020-85556
	14	5020-79046	5020-79047	5020-79048	5020-79049
	20	5020-85562	5020-85564	5020-85565	5020-85566
	30	5020-85572	5020-	5020-	5020-85576
	50	-	5020-	5020-	5020-85586
	100	-	5020-	5020-	5020-
Inertsil Diol 5 µm	6.0	5020-05652	5020-05654	5020-05655	5020-05656
	7.6	5020-05662	5020-05664	5020-05665	5020-05666
	10	5020-86552	5020-86554	5020-86555	5020-86556
	14	5020-79051	5020-79052	5020-79053	5020-79054
	20	5020-86562	5020-86564	5020-86565	5020-86566
	30	5020-86572	5020-	5020-	5020-86576
	50	-	5020-	5020-	5020-86586
	100	-	5020-	5020-	5020-
Inertsil SIL-100A 5 µm	6.0	5020-04352	5020-04354	5020-01713	5020-01714
	7.6	5020-04362	5020-04364	5020-04365	5020-04366
	10	5020-84352	5020-84354	5020-84355	5020-84356
	14	5020-79056	5020-79057	5020-79058	5020-79059
	20	5020-84362	5020-84364	5020-84365	5020-84366
	30	5020-84372	5020-	5020-	5020-84376
	50	-	5020-	5020-	5020-84386
	100	-	5020-	5020-	5020-
Inertsil SIL-150A 5 µm	6.0	5020-	5020-	5020-01013	5020-01014
	7.6	5020-	5020-	5020-	5020-06141
	10	5020-	5020-	5020-	5020-15611
	20	5020-	5020-	5020-	5020-15641
Inertsil WP300 SIL 5 µm	6.0	5020-05990	5020-05991	5020-05992	5020-05993
	7.6	5020-05995	5020-05996	5020-05997	5020-05998
	10	5020-86032	5020-86034	5020-86035	5020-86036
	14	5020-79091	5020-79092	5020-79093	5020-79094
	20	5020-86042	5020-86044	5020-86045	5020-86046
	30	5020-86052	5020-	5020-	5020-86056
	50	-	5020-	5020-	5020-86066
	100	-	5020-	5020-	5020-
Inertsil WP300 Diol 5 µm	6.0	5020-05980	5020-05981	5020-05982	5020-05983
	7.6	5020-05985	5020-05986	5020-05987	5020-05988
	10	5020-85932	5020-85934	5020-85935	5020-85936
	14	5020-79086	5020-79087	5020-79088	5020-79089
	20	5020-85942	5020-85944	5020-85945	5020-85946
	30	5020-85952	5020-	5020-	5020-85956
	50	-	5020-	5020-	5020-85966
	100	-	5020-	5020-	5020-
Inertsil Peptides C18 4 µm	6.0	5020-08062	5020-08064	5020-08065	5020-08066
	7.6	5020-08081	5020-	5020-	5020-08082
	10	5020-08083	5020-	5020-	5020-08084
	20	5020-08085	5020-	5020-	5020-08086
	30	5020-08087	5020-	5020-	5020-08088
	50	-	5020-	5020-	5020-08089

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Guard Columns for Preparative Columns



GL Sciences highly recommends the use of guard columns to protect and maximize the lifetime of your InertSustain or Inertsil preparative columns.

Guard Columns for Preparative Columns

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
InertSustain C18	5 µm	6.0 × 50	5020-07357
		7.6 × 50	5020-07367
		10 × 50	5020-14257
		14 × 50	5020-14267
		20 × 50	5020-14277
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
InertSustain AQ-C18	5 µm	6.0 × 50	5020-89777
		7.6 × 50	5020-89778
		10 × 50	5020-89779
		14 × 50	5020-89780
		20 × 50	5020-89781
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
InertSustainSwift C18	5 µm	6.0 × 50	5020-88074
		7.6 × 50	5020-88075
		10 × 50	5020-88076
		14 × 50	5020-88077
		20 × 50	5020-88078
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
Inertsil ODS-HL	5 µm	6.0 × 50	5020-87178
		7.6 × 50	5020-87179
		10 × 50	5020-87180
		14 × 50	5020-87181
		20 × 50	5020-87182
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
Inertsil ODS-4	5 µm	6.0 × 50	5020-03957
		7.6 × 50	5020-03967
		10 × 50	5020-81057
		14 × 50	5020-79005
		20 × 50	5020-81067
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
Inertsil ODS-3	5 µm	6.0 × 50	5020-04557
		7.6 × 50	5020-06801
		10 × 50	5020-06811
		14 × 50	5020-79015
		20 × 50	5020-06821
		30 × 50	5020-06831
		50 × 75	5020-06851
		100 × 100	5020-
	10 µm	10 × 50	5020-79104
		14 × 50	5020-79109
		20 × 50	5020-79114
		30 × 50	5020-79119
		50 × 75	5020-79121

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil ODS-SP	5 µm	6.0 × 50	5020-02757
		7.6 × 50	5020-02767
		10 × 50	5020-85257
		14 × 50	5020-79020
		20 × 50	5020-85267
		30 × 50	5020-85277
Inertsil ODS-P	5 µm	6.0 × 50	5020-04757
		7.6 × 50	5020-04767
		10 × 50	5020-84757
		14 × 50	5020-79030
		20 × 50	5020-84767
		30 × 50	5020-84777
Inertsil ODS-EP	5 µm	50 × 75	5020-84787
		100 × 100	5020-
		6.0 × 50	5020-02657
		7.6 × 50	5020-02667
		10 × 50	5020-18257
		14 × 50	5020-79025
Inertsil ODS-80A	5 µm	20 × 50	5020-18267
		30 × 50	5020-18277
		50 × 75	5020-18287
		100 × 100	5020-
Inertsil ODS-2	5 µm	7.6 × 50	5020-06136
		10 × 50	5020-15606
		20 × 50	5020-15636
		30 × 50	5020-15632
Inertsil ODS	5 µm	7.6 × 50	5020-06132
		10 × 50	5020-15602
		20 × 50	5020-15632
	10 µm	7.6 × 50	5020-31501
		10 × 50	5020-31511
		20 × 50	5020-31521
InertSustain C8	5 µm	7.6 × 50	5020-31601
		10 × 50	5020-31611
		20 × 50	5020-31621
		6.0 × 50	5020-16075
		7.6 × 50	5020-16076
		10 × 50	5020-16077
		14 × 50	5020-16078
		20 × 50	5020-16079
		30 × 50	5020-
		50 × 75	5020-
InertSustainSwift C8	5 µm	100 × 100	5020-
		6.0 × 50	5020-88378
		7.6 × 50	5020-88379
		10 × 50	5020-88380
		14 × 50	5020-88381
		20 × 50	5020-88382
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil C8-4	5 μm	6.0 × 50	5020-04091
		7.6 × 50	5020-04096
		10 × 50	5020-81247
		14 × 50	5020-79010
		20 × 50	5020-81257
		30 × 50	5020-
		50 × 75	5020-
Inertsil C8-3	5 μm	100 × 100	5020-
		6.0 × 50	5020-04957
		7.6 × 50	5020-04967
		10 × 50	5020-84957
		14 × 50	5020-79035
		20 × 50	5020-84967
		30 × 50	5020-84977
		50 × 75	5020-84987
	10 μm	100 × 100	5020-
		10 × 50	5020-79304
		14 × 50	5020-79309
Inertsil C8	5 μm	20 × 50	5020-79314
		30 × 50	5020-79319
		50 × 75	5020-79321
		7.6 × 50	5020-16133
InertSustain PFP	5 μm	10 × 50	5020-15603
		20 × 50	5020-15633
		6.0 × 50	5020-87777
		7.6 × 50	5020-87778
InertSustain Phenylhexyl	5 μm	10 × 50	5020-87779
		14 × 50	5020-87780
		20 × 50	5020-87781
		30 × 50	5020-
		6.0 × 50	5020-89074
		7.6 × 50	5020-89075
		10 × 50	5020-89076
InertSustain Phenyl	5 μm	14 × 50	5020-89077
		20 × 50	5020-89078
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
		6.0 × 50	5020-16375
		7.6 × 50	5020-16376
InertSustain Ph-3	5 μm	10 × 50	5020-16377
		14 × 50	5020-16378
		20 × 50	5020-16379
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
		6.0 × 50	5020-05157
Inertsil CN-3	5 μm	7.6 × 50	5020-05167
		10 × 50	5020-85157
		14 × 50	5020-79040
		20 × 50	5020-85167
		30 × 50	5020-85177
		50 × 75	5020-85187
		100 × 100	5020-
Inertsil CN-3	5 μm	6.0 × 50	5020-05357
		7.6 × 50	5020-05367
		10 × 50	5020-85357
		14 × 50	5020-79045
		20 × 50	5020-85367
		30 × 50	5020-85377
		50 × 75	5020-85387
Inertsil CN-3	5 μm	100 × 100	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
InertSustain Cyano	5 μm	6.0×50	5020-89324
		7.6×50	5020-89325
		10×50	5020-89326
		14×50	5020-89327
		20×50	5020-89328
		30×50	5020-
		50×75	5020-
Inertsil WP300 C18	5 μm	100×100	5020-
		6.0 × 50	5020-05954
		7.6 × 50	5020-05959
		10 × 50	5020-85837
		14 × 50	5020-79075
		20 × 50	5020-85847
		30 × 50	5020-85857
Inertsil WP300 C8	5 μm	50 × 75	5020-85867
		100 × 100	5020-
		6.0 × 50	5020-05964
		7.6 × 50	5020-05969
		10 × 50	5020-85737
		14 × 50	5020-79080
		20 × 50	5020-85747
Inertsil WP300 C4	5 μm	30 × 50	5020-85757
		50 × 75	5020-85767
		100 × 100	5020-
		6.0 × 50	5020-05974
		7.6 × 50	5020-05979
		10 × 50	5020-86137
		14 × 50	5020-79085
InertSustain Amide	5 μm	20 × 50	5020-86147
		30 × 50	5020-86157
		50 × 75	5020-86167
		100 × 100	5020-
		6.0 × 50	5020-88678
		7.6 × 50	5020-88679
		10 × 50	5020-88680
Inertsil Amide	5 μm	14 × 50	5020-88681
		20 × 50	5020-88682
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
		6.0 × 50	5020-07847
		7.6 × 50	5020-07857
Inertsil HILIC	5 μm	10 × 50	5020-86857
		14 × 50	5020-79070
		20 × 50	5020-86867
		30 × 50	5020-86877
		50 × 75	5020-86887
		100 × 100	5020-
		6.0 × 50	5020-07747
InertSustain NH2	5 μm	7.6 × 50	5020-07757
		10 × 50	5020-86757
		14 × 50	5020-79065
		20 × 50	5020-86767
		30 × 50	5020-86777
		50 × 75	5020-86787
		100 × 100	5020-
InertSustain NH2	5 μm	6.0 × 50	5020-16675
		7.6 × 50	5020-16676
		10 × 50	5020-16677
		14 × 50	5020-16678
		20 × 50	5020-16679
		30 × 50	5020-
		50 × 75	5020-
InertSustain NH2	5 μm	100 × 100	5020-

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Guard Columns for Preparative Columns

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil NH2	5 µm	6.0 × 50	5020-05557
		7.6 × 50	5020-05567
		10 × 50	5020-85557
		14 × 50	5020-79050
		20 × 50	5020-85567
		30 × 50	5020-85577
		50 × 75	5020-85587
		100 × 100	5020-
Inertsil Diol	5 µm	6.0 × 50	5020-05657
		7.6 × 50	5020-05667
		10 × 50	5020-86557
		14 × 50	5020-79055
		20 × 50	5020-86567
		30 × 50	5020-86577
		50 × 75	5020-86587
		100 × 100	5020-
Inertsil SIL-100A	5 µm	6.0 × 50	5020-04357
		7.6 × 50	5020-04367
		10 × 50	5020-84357
		14 × 50	5020-79060
		20 × 50	5020-84367
		30 × 50	5020-84377
		50 × 75	5020-84387
		100 × 100	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil SIL-150A	5 µm	7.6 × 50	5020-06131
		10 × 50	5020-15601
		20 × 50	5020-15631
Inertsil WP300 SIL	5 µm	6.0 × 50	5020-05994
		7.6 × 50	5020-05999
		10 × 50	5020-86037
		14 × 50	5020-79095
		20 × 50	5020-86047
		30 × 50	5020-86057
		50 × 75	5020-86067
		100 × 100	5020-
Inertsil WP300 Diol	5 µm	6.0 × 50	5020-05984
		7.6 × 50	5020-05989
		10 × 50	5020-85937
		14 × 50	5020-79090
		20 × 50	5020-85947
		30 × 50	5020-85957
		50 × 75	5020-85967
		100 × 100	5020-
Inertsil Peptides C18	4 µm	6.0 × 50	5020-08071
		7.6 × 50	5020-08072
		10 × 50	5020-08073
		20 × 50	5020-08074
		30 × 50	5020-08075
		50 × 75	5020-08076

PREP Guard Cartridges



PREP Guard Cartridges

PREP guard cartridges offer economic and effective protection for extending the lifetime of your InertSustain or Inertsil preparative columns. Protection available for 7.6, 10 and 20 mm I.D. preparative columns.

Phase	Length (mm)	I.D. (mm)	Replacement Cartridge (2 pcs)	Holder/Replacement Cartridge Set (2 Cartridges & 1 Holder)
			Cat. No.	Cat. No.
InertSustain C18	30	7.6	5020-15744	5020-15794
InertSustain AQ-C18	30	7.6	5020-89782	5020-89783
InertSustainSwift C18	30	7.6	5020-88079	5020-88080
Inertsil ODS-HL	30	7.6	5020-87183	5020-87184
Inertsil ODS-4	30	7.6	5020-15701	5020-15751
Inertsil ODS-3	30	7.6	5020-15703	5020-15753
Inertsil ODS-SP	30	7.6	5020-15706	5020-15756
Inertsil ODS-P	30	7.6	5020-15708	5020-15758
Inertsil ODS-EP	30	7.6	5020-15710	5020-15760
Inertsil ODS-80A	30	7.6	5020-15740	5020-15790
Inertsil ODS-2	30	7.6	5020-15735	5020-15785
Inertsil ODS	30	7.6	5020-15741	5020-15791
InertSustain C8	30	7.6	5020-16080	5020-16081
InertSustainSwift C8	30	7.6	5020-88383	5020-88384
Inertsil C8-4	30	7.6	5020-15702	5020-15752
Inertsil C8-3	30	7.6	5020-15714	5020-15764
Inertsil C8	30	7.6	5020-15736	5020-15786
Inertsil C4	30	7.6	5020-15738	5020-15788
InertSustain PFP	30	7.6	5020-87782	5020-87783
InertSustain Phenylhexyl	30	7.6	5020-89079	5020-89080
InertSustain Phenyl	30	7.6	5020-16380	5020-16381
Inertsil Ph-3	30	7.6	5020-15716	5020-15766
Inertsil Ph	30	7.6	5020-15737	5020-15787
InertSustain Cyano	30	7.6	5020-89329	5020-89330
Inertsil CN-3	30	7.6	5020-15718	5020-15768
Inertsil WP300 C18	30	7.6	5020-15728	5020-15778
Inertsil WP300 C8	30	7.6	5020-15729	5020-15779
Inertsil WP300 C4	30	7.6	5020-15730	5020-15780
InertSustain Amide	30	7.6	5020-88683	5020-88684
Inertsil Amide	30	7.6	5020-15745	5020-15795
Inertsil HILIC	30	7.6	5020-15724	5020-15774
InertSustain NH2	30	7.6	5020-16680	5020-16681
Inertsil NH2	30	7.6	5020-15720	5020-15770
Inertsil Diol	30	7.6	5020-15722	5020-15772
Inertsil SIL-100A	30	7.6	5020-15726	5020-15776
Inertsil SIL-150A	30	7.6	5020-15739	5020-15789
Inertsil WP300 Diol	30	7.6	5020-15731	5020-15781
Inertsil WP300 SIL	30	7.6	5020-15732	5020-15782
Inertsil Peptides C18	30	7.6	5020-15711	5020-15761

Holder

Description	Cat. No.
Holder for PREP Guard Cartridges	5020-06920

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Capillary Columns

• Capillary HPLC Columns	142
• Particle Type Capillary HPLC Columns.....	143
• Particle Type Capillary Micro Guard Columns	150
• Connection Kits for Capillary EX • EX-Nano Columns	151
• Monolithic Capillary HPLC Columns	152
• How to Connect MonoCap Columns	156
• Connection Kits	158

Capillary HPLC Columns

Capillary EX and Capillary EX-Nano HPLC columns are excellent in analyzing trace amounts of samples in proteomic and bioanalytical analysis with high sensitivity and high resolution. Capillary EX and Capillary EX-Nano columns are totally porous particle type columns, which the flow rate is generally set under 100 $\mu\text{L}/\text{min}$.

MonoCap is another capillary column, however, uses the monolithic silica technology offering high throughput, high sensitivity and high resolution separation of peptides and protein digests.

MonoCap Fast-Flow provides high throughput analysis at half of the operating pressure compared to totally porous particle type columns. MonoCap Nano-flow deliver extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes. Electrospray emitter for ESI-LC/MS, MonoSpray offer minimized sample diffusion resulting in high sensitivity. MonoCap Trap columns are also available for on-line preconcentration or desalting of

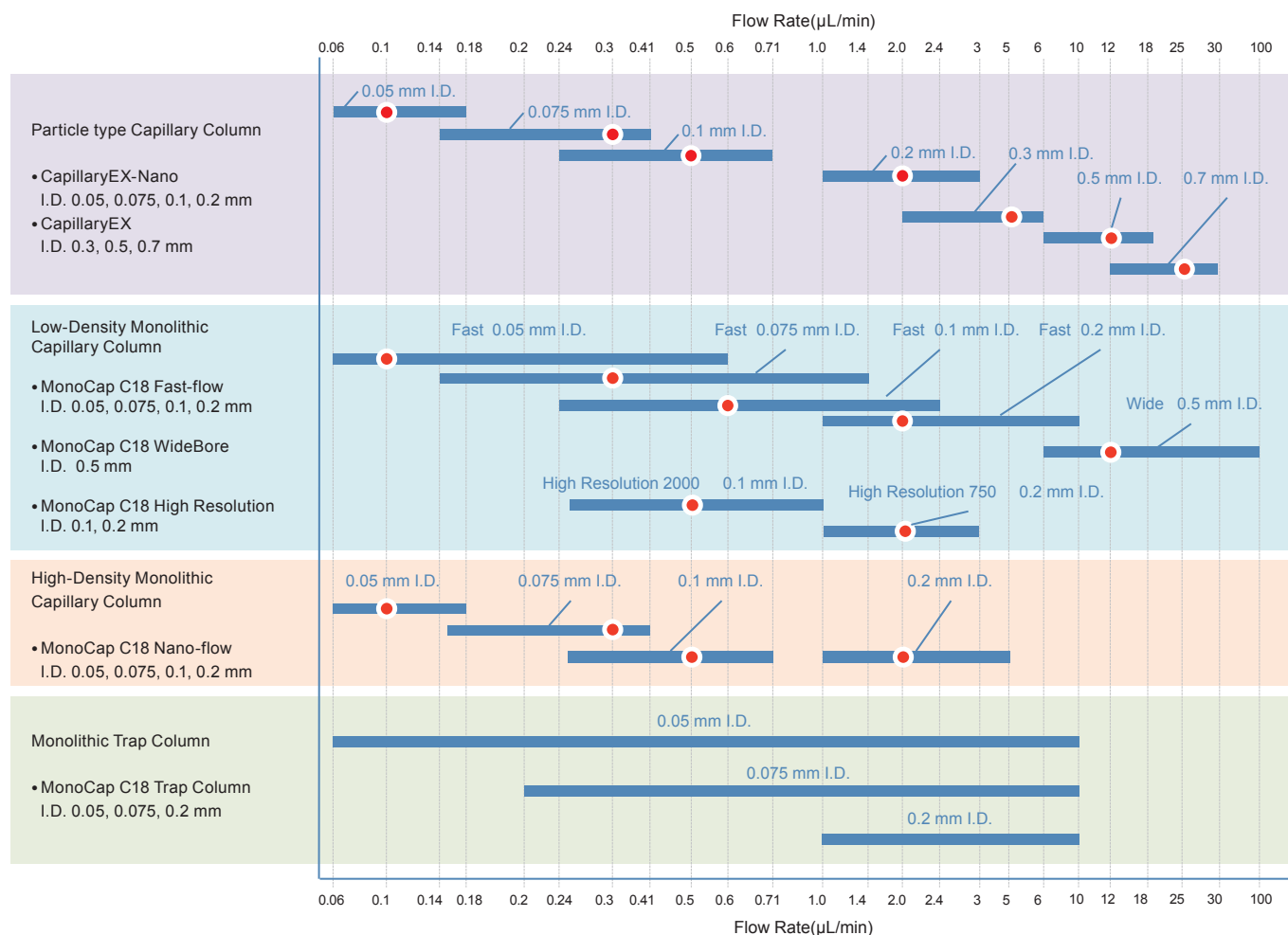
protein and peptide samples prior to HPLC separation with mass spectrometry detection.

The chart below illustrates the recommended use and flow rate ranges when using a 150 mm length column. The red circle indicates the linear velocity at 1 mm/s (Figure 1).



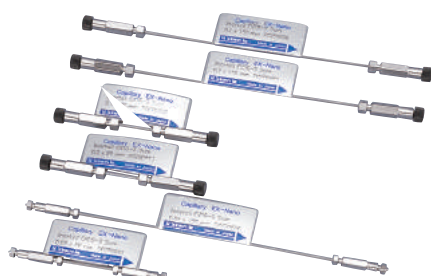
MonoCap High Resolution 2000

Figure 1 : Recommended Operating Flow Rate Range



Particle Type Capillary HPLC Columns

Columns with I.D. sizes of 0.05, 0.075, 0.1 and 0.2 mm are Capillary EX-Nano columns. I.D. sizes of 0.3, 0.5 and 0.7 mm are Capillary EX columns. Capillary EX-Nano columns introduces a fused silica capillary tube having a very smooth and clean inner surface resulting in high theoretical plates. Capillary EX columns employs the same column hardware used in analytical columns, which is very easy to use.



Capillary EX-Nano



Capillary EX

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
InertSustain C18	0.05	3	5020-15038	5020-15088	5020-15138
		5	5020-15037	5020-15087	5020-15137
	0.075	3	5020-15188	5020-15238	5020-15288
		5	5020-15187	5020-15237	5020-15287
	0.1	3	5020-15338	5020-15388	5020-15438
		5	5020-15337	5020-15387	5020-15437
	0.2	3	5020-15488	5020-15538	5020-15588
		5	5020-15487	5020-15537	5020-15587
	0.3	3	5020-11539	5020-11589	-
		5	5020-11538	5020-11588	-
	0.5	3	5020-11639	5020-11689	-
		5	5020-11638	5020-11688	-
	0.7	3	5020-11739	5020-11789	-
		5	5020-11738	5020-11788	-
InertSustain AQ-C18	0.05	3	5020-89894	5020-89895	5020-89896
		5	5020-89792	5020-89793	5020-89794
	0.075	3	5020-89897	5020-89898	5020-89899
		5	5020-89795	5020-89796	5020-89797
	0.1	3	5020-89900	5020-89901	5020-89902
		5	5020-89798	5020-89799	5020-89800
	0.2	3	5020-89903	5020-89904	5020-89905
		5	5020-89801	5020-89802	5020-89803
	0.3	3	5020-89887	5020-89888	-
		5	5020-89784	5020-89785	-
	0.5	3	5020-89889	5020-89890	-
		5	5020-89786	5020-89787	-
	0.7	3	5020-89891	5020-89892	-
		5	5020-89788	5020-89789	-

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (μ m)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
InertSustainSwift C18	0.05	3	5020-88183	5020-88184	5020-88185
		5	5020-88089	5020-88090	5020-88091
	0.075	3	5020-88186	5020-88187	5020-88188
		5	5020-88092	5020-88093	5020-88094
	0.1	3	5020-88189	5020-88190	5020-88191
		5	5020-88095	5020-88096	5020-88097
	0.2	3	5020-88192	5020-88193	5020-88194
		5	5020-88098	5020-88099	5020-88100
	0.3	3	5020-88176	5020-88177	-
		5	5020-88081	5020-88082	-
	0.5	3	5020-88178	5020-88179	-
		5	5020-88083	5020-88084	-
	0.7	3	5020-88180	5020-88181	-
		5	5020-88085	5020-88086	-
Inertsil ODS-HL	0.05	3	5020-87289	5020-87290	5020-87291
		5	5020-87193	5020-87194	5020-87195
	0.075	3	5020-87292	5020-87293	5020-87294
		5	5020-87196	5020-87197	5020-87198
	0.1	3	5020-87295	5020-87296	5020-87297
		5	5020-87199	5020-87200	5020-87201
	0.2	3	5020-87298	5020-87299	5020-87300
		5	5020-87202	5020-87203	5020-87204
	0.3	3	5020-87282	5020-87283	-
		5	5020-87185	5020-87186	-
	0.5	3	5020-87284	5020-87285	-
		5	5020-87187	5020-87188	-
	0.7	3	5020-87286	5020-87287	-
		5	5020-87189	5020-87190	-
Inertsil ODS-4	0.05	3	5020-15002	5020-15052	5020-15102
		5	5020-15001	5020-15051	5020-15101
	0.075	3	5020-15152	5020-15202	5020-15252
		5	5020-15151	5020-15201	5020-15251
	0.1	3	5020-15302	5020-15352	5020-15402
		5	5020-15301	5020-15351	5020-15401
	0.2	3	5020-15452	5020-15502	5020-15552
		5	5020-15451	5020-15501	5020-15551
	0.3	3	5020-11502	5020-11552	-
		5	5020-11501	5020-11551	-
	0.5	3	5020-11602	5020-11652	-
		5	5020-11601	5020-11651	-
	0.7	3	5020-11702	5020-11752	-
		5	5020-11701	5020-11751	-

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm	Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
			Cat.No.	Cat.No.	Cat.No.											
Inertsil ODS-3	0.05	3	5020-15005	5020-15055	5020-15105											
		4	5020-15004	5020-15054	5020-15104											
		5	5020-15003	5020-15053	5020-15103											
	0.075	3	5020-15155	5020-15205	5020-15255											
		4	5020-15154	5020-15204	5020-15254											
		5	5020-15153	5020-15203	5020-15253											
	0.1	3	5020-15305	5020-15355	5020-15405											
		4	5020-15304	5020-15354	5020-15404											
		5	5020-15303	5020-15353	5020-15403											
	0.2	3	5020-15455	5020-15505	5020-15555											
		4	5020-15454	5020-15504	5020-15554											
		5	5020-15453	5020-15503	5020-15553											
	0.3	3	5020-11505	5020-11555	-											
		4	5020-11504	5020-11554	-											
		5	5020-11503	5020-11553	-											
	0.5	3	5020-11605	5020-11655	-											
		4	5020-11604	5020-11654	-											
		5	5020-11603	5020-11653	-											
	0.7	3	5020-11705	5020-11755	-											
		4	5020-11704	5020-11754	-											
		5	5020-11703	5020-11753	-											
Inertsil ODS-SP	0.05	3	5020-15007	5020-15057	5020-15107											
		5	5020-15006	5020-15056	5020-15106											
		5	5020-15006	5020-15056	5020-15106											
	0.075	3	5020-15157	5020-15207	5020-15257											
		5	5020-15156	5020-15206	5020-15256											
	0.1	3	5020-15307	5020-15357	5020-15407											
		5	5020-15306	5020-15356	5020-15406											
	0.2	3	5020-15457	5020-15507	5020-15557											
		5	5020-15456	5020-15506	5020-15556											
	0.3	3	5020-11507	5020-11557	-											
		5	5020-11506	5020-11556	-											
	0.5	3	5020-11607	5020-11657	-											
		5	5020-11606	5020-11656	-											
	0.7	3	5020-11707	5020-11757	-											
		5	5020-11706	5020-11756	-											
Inertsil ODS-P	0.05	3	5020-15009	5020-15059	5020-15109											
		5	5020-15008	5020-15058	5020-15108											
	0.075	3	5020-15159	5020-15209	5020-15259											
		5	5020-15158	5020-15208	5020-15258											
	0.1	3	5020-15309	5020-15359	5020-15409											
		5	5020-15308	5020-15358	5020-15408											
	0.2	3	5020-15459	5020-15509	5020-15559											
		5	5020-15458	5020-15508	5020-15558											
	0.3	3	5020-11509	5020-11559	-											
		5	5020-11508	5020-11558	-											
	0.5	3	5020-11609	5020-11659	-											
		5	5020-11608	5020-11658	-											
	0.7	3	5020-11709	5020-11759	-											
		5	5020-11708	5020-11758	-											
InertSustain C8	0.05	3	5020-16191	5020-16192	5020-16193											
		5	5020-16090	5020-16091	5020-16092											
	0.075	3	5020-16194	5020-16195	5020-16196											
		5	5020-16093	5020-16094	5020-16095											
	0.1	3	5020-16197	5020-16198	5020-16199											
		5	5020-16096	5020-16097	5020-16098											
	0.2	3	5020-16200	5020-16201	5020-16202											
		5	5020-16099	5020-16100	5020-16101											
	0.3	3	5020-16184	5020-16185	-											
		5	5020-16082	5020-16083	-											
	0.5	3	5020-16186	5020-16187	-											
		5	5020-16084	5020-16085	-											
	0.7	3	5020-16188	5020-16189	-											
		5	5020-16086	5020-16087	-											

Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
InertSustainSwift C8	0.05	3	5020-88489	5020-88490	5020-88491
		5	5020-88393	5020-88394	5020-88395
	0.075	3	5020-88492	5020-88493	5020-88494
		5	5020-88396	5020-88397	5020-88398
	0.1	3	5020-88495	5020-88496	5020-88497
		5	5020-88399	5020-88400	5020-88401
	0.2	3	5020-88498	5020-88499	5020-88500
		5	5020-88402	5020-88403	5020-88404
	0.3	3	5020-88482	5020-88483	-
		5	5020-88385	5020-88386	-
	0.5	3	5020-88484	5020-88485	-
		5	5020-88387	5020-88388	-
	0.7	3	5020-88486	5020-88487	-
		5	5020-88389	5020-88390	-
Inertsil C8-4	0.05	3	5020-15036	5020-15086	5020-15136
		5	5020-15035	5020-15085	5020-15135
	0.075	3	5020-15186	5020-15236	5020-15286
		5	5020-15185	5020-15235	5020-15285
	0.1	3	5020-15336	5020-15386	5020-15436
		5	5020-15335	5020-15385	5020-15435
	0.2	3	5020-15486	5020-15536	5020-15586
		5	5020-15485	5020-15535	5020-15585
	0.3	3	5020-11536	5020-11586	-
		5	5020-11535	5020-11585	-
	0.5	3	5020-11636	5020-11686	-
		5	5020-11635	5020-11685	-
	0.7	3	5020-11736	5020-11786	-
		5	5020-11735	5020-11785	-
Inertsil C8-3	0.05	3	5020-15015	5020-15065	5020-15115
		5	5020-15014	5020-15064	5020-15114
	0.075	3	5020-15165	5020-15215	5020-15265
		5	5020-15164	5020-15214	5020-15264
	0.1	3	5020-15315	5020-15365	5020-15415
		5	5020-15314	5020-15364	5020-15414
	0.2	3	5020-15465	5020-15515	5020-15565
		5	5020-15464	5020-15514	5020-15564
	0.3	3	5020-11515	5020-11565	-
		5	5020-11514	5020-11564	-
	0.5	3	5020-11615	5020-11665	-
		5	5020-11614	5020-11664	-
	0.7	3	5020-11715	5020-11765	-
		5	5020-11714	5020-11764	-
Inertsil WP300 C18	0.05	5	5020-15028	5020-15078	5020-15128
	0.075	5	5020-15178	5020-15228	5020-15278
	0.1	5	5020-15328	5020-15378	5020-15428
	0.2	5	5020-15478	5020-15528	5020-15578
	0.3	5	5020-11528	5020-11578	-
	0.5	5	5020-11628	5020-11678	-
	0.7	5	5020-11728	5020-11778	-
Inertsil WP300 C8	0.05	5	5020-15029	5020-15079	5020-15129
	0.075	5	5020-15179	5020-15229	5020-15279
	0.1	5	5020-15329	5020-15379	5020-15429
	0.2	5	5020-15479	5020-15529	5020-15579
	0.3	5	5020-11529	5020-11579	-
	0.5	5	5020-11629	5020-11679	-
	0.7	5	5020-11729	5020-11779	-

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm	
			Cat.No.	Cat.No.	Cat.No.	
InertSustain PFP	0.05	3	5020-87891	5020-87892	5020-87893	Reversed Phase Columns
		5	5020-87791	5020-87792	5020-87793	
	0.075	3	5020-87894	5020-87895	5020-87896	HILIC Columns
		5	5020-87794	5020-87795	5020-87796	
	0.1	3	5020-87897	5020-87898	5020-87899	
		5	5020-87797	5020-87798	5020-87799	
	0.2	3	5020-87900	5020-87901	5020-87902	
		5	5020-87800	5020-87801	5020-87802	
	0.3	3	5020-87884	5020-87885	-	
		5	5020-87784	5020-87785	-	
	0.5	3	5020-87886	5020-87887	-	
		5	5020-87786	5020-87787	-	
	0.7	3	5020-87888	5020-87889	-	
		5	5020-87788	5020-87789	-	
InertSustain Phenylhexyl	0.05	3	5020-89183	5020-89184	5020-89185	Normal Phase Columns
		5	5020-89089	5020-89090	5020-89091	
	0.075	3	5020-89186	5020-89187	5020-89188	
		5	5020-89092	5020-89093	5020-89094	
	0.1	3	5020-89189	5020-89190	5020-89191	
		5	5020-89095	5020-89096	5020-89097	
	0.2	3	5020-89192	5020-89193	5020-89194	
		5	5020-89098	5020-89099	5020-89100	
	0.3	3	5020-89176	5020-89177	-	
		5	5020-89081	5020-89082	-	
	0.5	3	5020-89178	5020-89179	-	
		5	5020-89083	5020-89084	-	
	0.7	3	5020-89180	5020-89181	-	
		5	5020-89085	5020-89086	-	
InertSustain Phenyl	0.05	3	5020-16491	5020-16492	5020-16493	Ion Exchange Columns
		5	5020-16390	5020-16391	5020-16392	
	0.075	3	5020-16494	5020-16495	5020-16496	
		5	5020-16393	5020-16394	5020-16395	
	0.1	3	5020-16497	5020-16498	5020-16499	
		5	5020-16396	5020-16397	5020-16398	
	0.2	3	5020-16500	5020-16501	5020-16502	
		5	5020-16399	5020-16400	5020-16401	
	0.3	3	5020-16484	5020-16485	-	
		5	5020-16382	5020-16383	-	
	0.5	3	5020-16486	5020-16487	-	
		5	5020-16384	5020-16385	-	
	0.7	3	5020-16488	5020-16489	-	
		5	5020-16386	5020-16387	-	
Inertsil Ph-3	0.05	3	5020-15017	5020-15067	5020-15117	Application Specific Columns
		5	5020-15016	5020-15066	5020-15116	
	0.075	3	5020-15167	5020-15217	5020-15267	
		5	5020-15166	5020-15216	5020-15266	
	0.1	3	5020-15317	5020-15367	5020-15417	
		5	5020-15316	5020-15366	5020-15416	
	0.2	3	5020-15467	5020-15517	5020-15567	
		5	5020-15466	5020-15516	5020-15566	
	0.3	3	5020-11517	5020-11567	-	
		5	5020-11516	5020-11566	-	
	0.5	3	5020-11617	5020-11667	-	
		5	5020-11616	5020-11666	-	
	0.7	3	5020-11717	5020-11767	-	
		5	5020-11716	5020-11766	-	
InertSustain Amide	0.05	3	5020-88789	5020-88790	5020-88791	Preparative Columns
		5	5020-88693	5020-88694	5020-88695	
	0.075	3	5020-88792	5020-88793	5020-88794	
		5	5020-88696	5020-88697	5020-88698	
	0.1	3	5020-88795	5020-88796	5020-88797	
		5	5020-88699	5020-88700	5020-88701	
	0.2	3	5020-88798	5020-88799	5020-88800	
		5	5020-88702	5020-88703	5020-88704	
	0.3	3	5020-88782	5020-88783	-	
		5	5020-88685	5020-88686	-	
	0.5	3	5020-88784	5020-88785	-	
		5	5020-88687	5020-88688	-	
	0.7	3	5020-88786	5020-88787	-	
		5	5020-88689	5020-88690	-	

Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil Amide	0.05	3	5020-15040	5020-15090	5020-15140
		5	5020-15039	5020-15089	5020-15139
	0.075	3	5020-15190	5020-15240	5020-15290
		5	5020-15189	5020-15239	5020-15289
	0.1	3	5020-15340	5020-15390	5020-15440
		5	5020-15339	5020-15389	5020-15439
	0.2	3	5020-15490	5020-15540	5020-15590
		5	5020-15489	5020-15539	5020-15589
	0.3	3	5020-11541	5020-11591	-
		5	5020-11540	5020-11590	-
	0.5	3	5020-11641	5020-11691	-
		5	5020-11640	5020-11690	-
	0.7	3	5020-11741	5020-11791	-
		5	5020-11740	5020-11790	-
Inertsil HILIC	0.05	3	5020-15025	5020-15075	5020-15125
		5	5020-15024	5020-15074	5020-15124
	0.075	3	5020-15175	5020-15225	5020-15275
		5	5020-15174	5020-15224	5020-15274
	0.1	3	5020-15325	5020-15375	5020-15425
		5	5020-15324	5020-15374	5020-15424
	0.2	3	5020-15475	5020-15525	5020-15575
		5	5020-15474	5020-15524	5020-15574
	0.3	3	5020-11525	5020-11575	-
		5	5020-11524	5020-11574	-
	0.5	3	5020-11625	5020-11675	-
		5	5020-11624	5020-11674	-
	0.7	3	5020-11725	5020-11775	-
		5	5020-11724	5020-11774	-
InertSustain NH2	0.05	3	5020-16791	5020-16792	5020-16793
		5	5020-16690	5020-16691	5020-16692
	0.075	3	5020-16794	5020-16795	5020-16796
		5	5020-16693	5020-16694	5020-16695
	0.1	3	5020-16797	5020-16798	5020-16799
		5	5020-16696	5020-16697	5020-16698
	0.2	3	5020-16800	5020-16801	5020-16802
		5	5020-16699	5020-16700	5020-16701
	0.3	3	5020-16784	5020-16785	-
		5	5020-16682	5020-16683	-
	0.5	3	5020-16786	5020-16787	-
		5	5020-16684	5020-16685	-
	0.7	3	5020-16788	5020-16789	-
		5	5020-16686	5020-16687	-
Inertsil NH2	0.05	3	5020-15021	5020-15071	5020-15121
		5	5020-15020	5020-15070	5020-15120
	0.075	3	5020-15171	5020-15221	5020-15271
		5	5020-15170	5020-15220	5020-15270
	0.1	3	5020-15321	5020-15371	5020-15421
		5	5020-15320	5020-15370	5020-15420
	0.2	3	5020-15471	5020-15521	5020-15571
		5	5020-15470	5020-15520	5020-15570
	0.3	3	5020-11521	5020-11571	-
		5	5020-11520	5020-11570	-
	0.5	3	5020-11621	5020-11671	-
		5	5020-11620	5020-11670	-
	0.7	3	5020-11721	5020-11771	-
		5	5020-11720	5020-11770	-
InertSustain Cyano	0.05	3	5020-89433	5020-89434	5020-89435
		5	5020-89339	5020-89340	5020-89341
	0.075	3	5020-89436	5020-89437	5020-89438
		5	5020-89342	5020-89343	5020-89344
	0.1	3	5020-89439	5020-89440	5020-89441
		5	5020-89345	5020-89346	5020-89347
	0.2	3	5020-89442	5020-89443	5020-89444
		5	5020-89348	5020-89349	5020-89350
	0.3	3	5020-89426	5020-89427	5020-89428
		5	5020-89331	5020-89332	-
	0.5	3	5020-89428	5020-89429	-
		5	5020-89333	5020-89334	-
	0.7	3	5020-89430	5020-89431	-
		5	5020-89335	5020-89335	-

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil CN-3	0.05	3	5020-15019	5020-15069	5020-15119
		5	5020-15018	5020-15068	5020-15118
	0.075	3	5020-15169	5020-15219	5020-15269
		5	5020-15168	5020-15218	5020-15268
	0.1	3	5020-15319	5020-15369	5020-15419
		5	5020-15318	5020-15368	5020-15418
	0.2	3	5020-15469	5020-15519	5020-15569
		5	5020-15468	5020-15518	5020-15568
	0.3	3	5020-11519	5020-11569	-
		5	5020-11518	5020-11568	-
	0.5	3	5020-11619	5020-11669	-
		5	5020-11618	5020-11668	-
	0.7	3	5020-11719	5020-11769	-
		5	5020-11718	5020-11768	-
Inertsil Diol	0.05	3	5020-15023	5020-15073	5020-15123
		5	5020-15022	5020-15072	5020-15122
	0.075	3	5020-15173	5020-15223	5020-15273
		5	5020-15172	5020-15222	5020-15272
	0.1	3	5020-15323	5020-15373	5020-15423
		5	5020-15322	5020-15372	5020-15422
	0.2	3	5020-15473	5020-15523	5020-15573
		5	5020-15472	5020-15522	5020-15572
	0.3	3	5020-11523	5020-11573	-
		5	5020-11522	5020-11572	-
	0.5	3	5020-11623	5020-11673	-
		5	5020-11622	5020-11672	-
	0.7	3	5020-11723	5020-11773	-
		5	5020-11722	5020-11772	-
Inertsil SIL-100A	0.05	3	5020-15027	5020-15077	5020-15127
		5	5020-15026	5020-15076	5020-15126
	0.075	3	5020-15177	5020-15227	5020-15277
		5	5020-15176	5020-15226	5020-15276
	0.1	3	5020-15327	5020-15377	5020-15427
		5	5020-15326	5020-15376	5020-15426
	0.2	3	5020-15477	5020-15527	5020-15577
		5	5020-15476	5020-15526	5020-15576
	0.3	3	5020-11527	5020-11577	-
		5	5020-11526	5020-11576	-
	0.5	3	5020-11627	5020-11677	-
		5	5020-11626	5020-11676	-
	0.7	3	5020-11727	5020-11777	-
		5	5020-11726	5020-11776	-
Inertsil AX	0.05	5	5020-15033	5020-15083	5020-15133
	0.075	5	5020-15183	5020-15233	5020-15283
	0.1	5	5020-15333	5020-15383	5020-15433
	0.2	5	5020-15483	5020-15533	5020-15583
	0.3	5	5020-11533	5020-11583	-
	0.5	5	5020-11633	5020-11683	-
	0.7	5	5020-11733	5020-11783	-
Inertsil CX	0.05	5	5020-15034	5020-15084	5020-15134
	0.075	5	5020-15184	5020-15234	5020-15284
	0.1	5	5020-15334	5020-15384	5020-15434
	0.2	5	5020-15484	5020-15534	5020-15584
	0.3	5	5020-11534	5020-11584	-
	0.5	5	5020-11634	5020-11684	-
	0.7	5	5020-11734	5020-11784	-

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Particle Type Capillary Micro Guard Columns

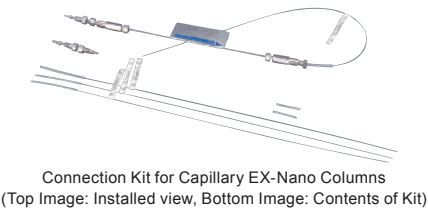
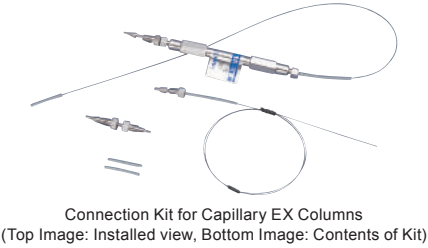


Capillary EX Micro Guard Columns

Capillary EX Micro Guard columns are available in 2 mm length which are ideal for the use of sample preconcentration and sample cleanup. Non-metal hardware is also available to eliminate metal contamination from the column hardware.

Phase	I.D. (mm)	Particle Size (μm)	Length (mm)	Wetted Part
				Metal
				Cat. No.
InertSustain C18	0.3	3	2	5020-11847
		5	2	5020-11846
InertSustain AQ-C18	0.3	3	2	5020-89893
		5	2	5020-89790
InertSustainSwift C18	0.3	3	2	5020-88182
		5	2	5020-88087
Inertsil ODS-HL	0.3	3	2	5020-87288
		5	2	5020-87191
Inertsil ODS-4	0.3	3	2	5020-11802
		5	2	5020-11801
Inertsil ODS-3	0.3	3	2	5020-11805
		5	2	5020-11803
Inertsil ODS-SP	0.3	3	2	5020-11807
		5	2	5020-11806
Inertsil ODS-P	0.3	3	2	5020-11809
		5	2	5020-11808
InertSustain C8	0.3	3	2	5020-16190
		5	2	5020-16088
InertSustainSwift C8	0.3	3	2	5020-88488
		5	2	5020-88391
Inertsil C8-4	0.3	3	2	5020-11836
		5	2	5020-11835
Inertsil C8-3	0.3	3	2	5020-11815
		5	2	5020-11814
Inertsil WP300 C18	0.3	5	2	5020-11828
Inertsil WP300 C8	0.3	5	2	5020-11829
InertSustain Phenylhexyl	0.3	3	2	5020-89182
		5	2	5020-89087
InertSustain Phenyl	0.3	3	2	5020-16490
		5	2	5020-16388
Inertsil Ph-3	0.3	3	2	5020-11817
		5	2	5020-11816
InertSustain Amide	0.3	3	2	5020-88788
		5	2	5020-88691
Inertsil Amide	0.3	3	2	5020-11849
		5	2	5020-11848
Inertsil HILIC	0.3	3	2	5020-11825
		5	2	5020-11824
InertSustain NH2	0.3	3	2	5020-16790
		5	2	5020-16688
Inertsil NH2	0.3	3	2	5020-11821
		5	2	5020-11820
InertSustain Cyano	0.3	3	2	5020-89432
		5	2	5020-89337
Inertsil CN-3	0.3	3	2	5020-11819
		5	2	5020-11818
Inertsil Diol	0.3	3	2	5020-11823
		5	2	5020-11822
Inertsil SIL-100A	0.3	3	2	5020-11827
		5	2	5020-11826
Inertsil AX	0.3	5	2	5020-11833
Inertsil CX	0.3	5	2	5020-11834

Connection Kits for Capillary EX • EX-Nano Columns



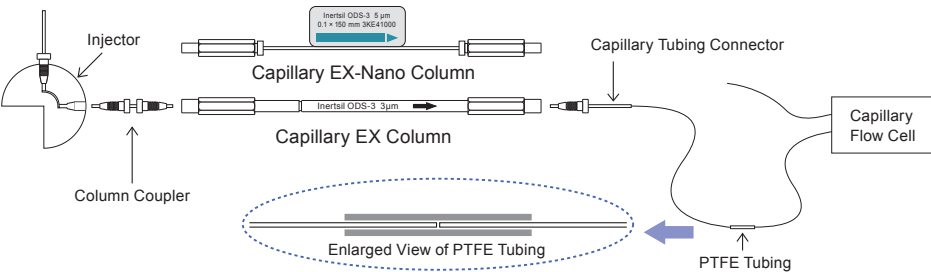
Connection Kit for Capillary EX Columns (0.3, 0.5, 0.7 I.D. mm)

Contents of Kit	Cat.No.
·Column Coupler ·40 × 0.1 mm I.D. 1/16 inch O.D.Tubing (Both ends with male nuts including PEEK ferrules)	5020-01880
·Capillary Tubing Connector ·500 × 0.075 mm I.D. 0.375 mm O.D. Tubing (Male nut, PEEK ferrule, 1/16 inch O.D. PTFE with sleeve)	
·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

Connection Kit for Capillary EX-Nano Columns (0.05, 0.075, 0.1, 0.2 I.D. mm)

Contents of Kit	Cat.No.
·Column Coupler ·40 × 0.05 mm I.D. 1/16 inch O.D. Tubing (Both ends with male nuts including PEEK ferrules)	5020-01881
·Capillary Tubing Connector ·300 × 0.05 mm I.D. 0.375 mm O.D. Tubing ·300 × 0.03 mm I.D. 0.375 mm O.D. Tubing ·300 × 0.02 mm I.D. 0.375 mm O.D. Tubing (Male nut, PEEK ferrule, 1/16 inch O.D. PTFE with sleeve)	
·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

How To Connect



Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

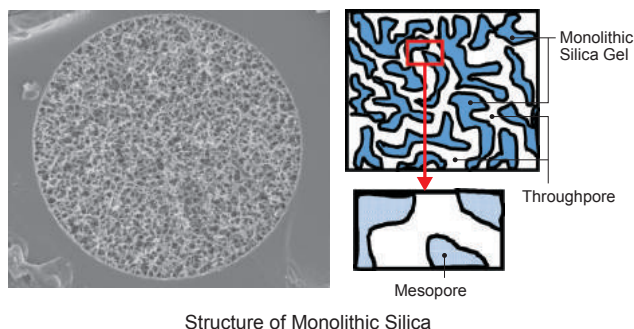
Capillary Columns

Applications

Cat. No. Index

Monolithic Capillary HPLC Columns

MonoCap Series



Structure of Monolithic Silica

GL Sciences' MonoCap series, created synthetically via sol-gel method, and an octadecyl silane chemically bonded, has a very uniform three dimensional structure that shows excellent reproducibility from batch-to-batch. The solid structure of GL Sciences' monolithic silica eliminates the need for frits or filters at the ends of the column, thereby reducing dead volume that might otherwise lead to band broadening or sample recovery. The high porosity of our monolithic silica allows high flow rates to be used without loss of resolution or creation of high operating pressure. An optimized balance of throughpores and mesopores provides the critically important combination of efficiency, separation speed, large volume sample-loading, and small volume sample-recovery.

MonoCap High Resolution provide extremely high efficiency, delivering over 200,000 plates for a 2,000 mm length column. The High Resolution Ultra type deliver over 300,000 plates.

The Fast-flow type is compatible with high flow rate analysis due to its' low flow resistance. In addition, the equilibration time can be minimized further by setting the flow rate high.

MonoCap Nano-flow is a high-density monolithic capillary column offering extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes.

MonoCap Trap columns have a relatively big throughpore, which are available for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

Physical Properties of MonoCap Series

Description	Monolithic Silica	Skeleton	Throughpore	Mesopore	Porosity	Functional Group	End-Capping	Max. Operating Pressure
MonoCap C18 High Resolution 750	High Purity Silica Gel	1 μ m	2 μ m	15 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 High Resolution 2000		1 μ m	2 μ m	15 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap C18 High Resolution Ultra 2000		1 μ m	2 μ m	11 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap C18 High Resolution 1000		1 μ m	2 μ m	15 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap C18 High Resolution Ultra 1000		1 μ m	2 μ m	11 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap HILIC-UP High Resolution 2000		1 μ m	2 μ m	12 nm	85 %	Octadecyl	No	35 MPa (350 bar)
MonoCap C18 Fast-flow		1 μ m	2 μ m	15 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 Nano-flow		1 μ m	1 μ m	11 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 WideBore		1 μ m	2 μ m	11 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 Trap Column		2 μ m	5 μ m	11 nm	85 %	Octadecyl	Yes	20 MPa (200 bar)
MonoCap Amide		1 μ m	2 μ m	15 nm	85 %	Octadecyl	No	22 MPa (220 bar)
MonoCap SCX		2 μ m	5 μ m	11 nm	85 %	Octadecyl	No	20 MPa (200 bar)

* Based on monolithic technology, Merck KGaA, Darmstadt, Germany.

End-fittings of MonoCap Monolithic Capillary HPLC Columns

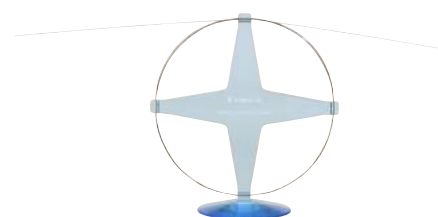
MonoCap C18 High Resolution 750
MonoCap C18 Fast-flow
MonoCap Nano-flow
MonoCap C18 WideBore
MonoCap Amide
MonoCap SCX

1. Metal Hardware
End-fittings are Parker Style (UP type).
Valco 1/32 inch (6-40 UNF) end-fittings can also be arranged upon request, indicate 1/32 inch when ordering.
2. PEEK Hardware
1/16 inch male nut, ferrule and PTFE sleeve are included.

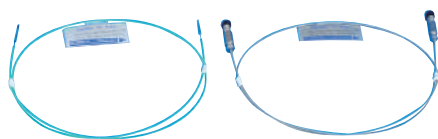
MonoCap C18 High Resolution 2000
MonoCap C18 High Resolution Ultra 2000
MonoCap C18 High Resolution 1000
MonoCap C18 High Resolution Ultra 1000
MonoCap HILIC-UP High Resolution

End-fittings are not included.
The connection kits shown at page 156 must be purchased separately once.

MonoCap C18 High Resolution/MonoCap C18 High Resolution Ultra



MonoCap High Resolution 2000



PEEK Metal

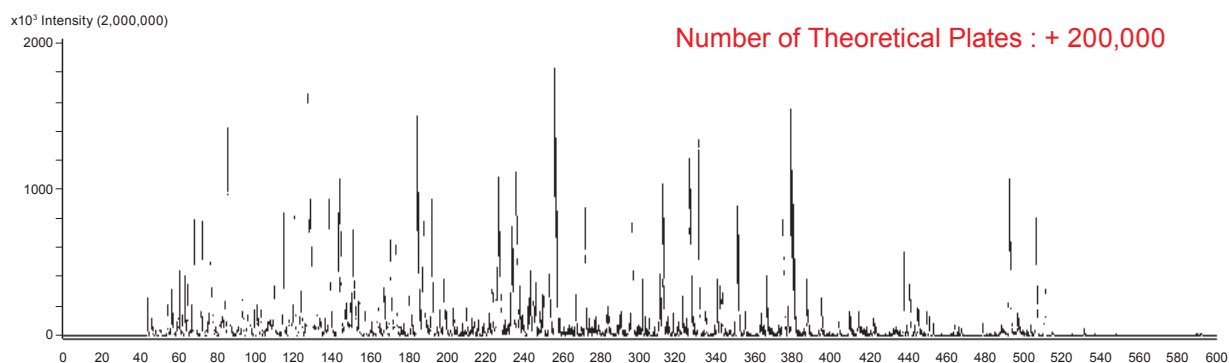
MonoCap High Resolution 750

Maximizing all the benefits and advantages of monolithic technology, MonoCap High Resolution and High Resolution Ultra are appropriate for the efficient separation of peptides and protein digests.

MonoCap High Resolution 750 deliver over 60,000 plates, while 2000 deliver over 300,000 plates.

The newly-introduced High Resolution Ultra type deliver over 300,000 plate number.

Figure 1 : Analysis of Tryptic Digests



Conditions

Column : MonoCap C18 High Resolution 2000 (2000 mm × 0.1 mm I.D.)
 Trap column : MonoCap C18 Trap Column (50 mm × 0.075 mm I.D.)
 Eluent : A) 0.1 % HCOOH in CH₃CN
 B) 0.1 % HCOOH in H₂O
 A/B = 10/90 - 600 min - 45/55, v/v

Flow Rate : 0.5 µL/min
 Injection Vol : 5 µL
 Detection : MS (TIC *m/z* 500 - 1500)
 Sample : Tryptic digest of proteins

Ordering Information

MonoCap C18 High Resolution Ultra 2000

I.D. (mm)	Length (mm)	Cat. No.
0.075	2000	5020-10006
0.1	2000	5020-10018

MonoCap C18 High Resolution Ultra 1000

I.D. (mm)	Length (mm)	Cat. No.
0.075	1000	5020-10066
0.1	1000	5020-10067

MonoCap C18 High Resolution 750

I.D. (mm)	Length (mm)	Hardware Material	Cat. No.
0.1	750	Metal	5020-10113
		PEEK	5020-10013
0.2	750	Metal	5020-10123
		PEEK	5020-10023

MonoCap C18 High Resolution 2000

I.D. (mm)	Length (mm)	Cat. No.
0.075	2000	5020-10005
0.1	2000	5020-10015

MonoCap C18 High Resolution 1000

I.D. (mm)	Length (mm)	Cat. No.
0.3 (1/16 inch)	1000	5020-10007
0.3 (1/32 inch)	1000	5020-10008

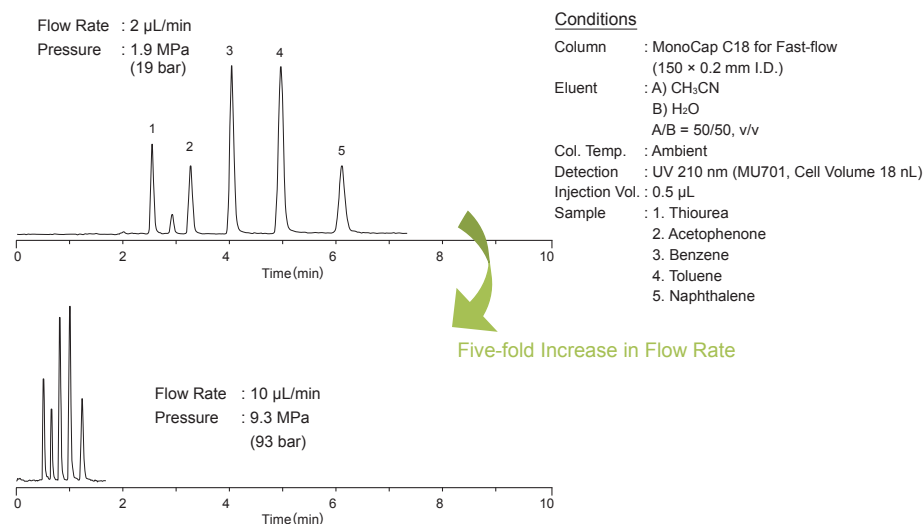
MonoCap HILIC-UP High Resolution 2000

I.D. (mm)	Length (mm)	Cat. No.
0.1	2000	5020-10019

Monolithic Capillary HPLC Columns

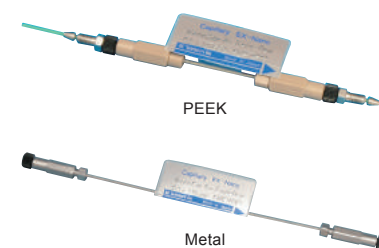
MonoCap C18 Fast-flow

Figure 1 : Workable at High Flow Rates without Sacrificing Efficiency



Workable at a broad range of linear velocity from 0.5 to 5 mm/s without sacrificing efficiency and separation at high speed. The number of theoretical plates produced by MonoCap C18 Fast-flow is nearly equivalent to a totally porous particle type capillary column packed with a 5 µm packing material. Columns are protected by either metal or PEEK hardware.

End-fittings are 1/16 inch (10-32 UNF). 1/32 inch end-fittings are also available upon request.



I.D. (mm)	Length (mm)	50	150	250
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.
0.05	Metal	5020-10102	5020-10101	5020-10100
	PEEK*	5020-10002	5020-10001	5020-10000
0.075	Metal	5020-10211	5020-10212	5020-10213
	PEEK*	5020-10221	5020-10222	5020-10223
0.1	Metal	5020-10112	5020-10111	5020-10110
	PEEK*	5020-10012	5020-10011	5020-10010
0.2	Metal	5020-10122	5020-10121	5020-10120
	PEEK*	5020-10022	5020-10021	5020-10020

MonoCap C18 Nano-flow



MonoCap C18 Nano-flow produces higher number of theoretical plates compared to a totally porous particle type capillary column packed with a 3 µm packing material. It can be operated at a wide range of flow rate with low back pressure and achieve very high sensitive results in Nano-LC-ESI/MS applications. Columns are protected by either metal or PEEK hardware.

I.D. (mm)	Length (mm)	50	150
	Material of Hardware	Cat.No.	Cat.No.
0.05	Metal	5020-10143	5020-10141
	PEEK*	5020-10043	5020-10041
0.075	Metal	5020-10231	5020-10232
	PEEK*	5020-10241	5020-10242
0.1	Metal	5020-10153	5020-10151
	PEEK*	5020-10053	5020-10051
0.2	Metal	5020-10163	5020-10161
	PEEK*	5020-10063	5020-10061

* All 50 mm length PEEK columns does not come with a hardware and will be supplied with 3 pcs of columns only.

MonoCap C18 WideBore



The MonoCap C18 Fast-flow is also available in 0.5 mm I.D. size, which can be used at a wide range of flow rate from 6 to 100 $\mu\text{L}/\text{min}$ without sacrificing efficiency. The number of theoretical plates produced by MonoCap C18 WideBore is nearly equivalent to a totally porous particle type capillary column packed with a 5 μm packing material. Columns are protected by metal hardware.

I.D. (mm)	Length (mm)	50	150	250
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.
0.5	Metal	5020-10202	5020-10201	5020-10200

MonoCap C18 Trap Column



MonoCap C18 Trap Column with Hardware
(Top Image: 1/16 inch End-fittings, Bottom Image: 1/32 inch End-fittings)

MonoCap Trap columns have a relatively big throughpore and workable at a high flow rate such as 10 $\mu\text{L}/\text{min}$. This benefit makes MonoCap Trap columns to be appropriate for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

End-fittings are 1/16 inch (10-32 UNF). 1/32 inch end-fittings are also available upon request.

I.D. (mm)	Length (mm)	50	100	150
	Hardware	Cat.No.	Cat.No.	Cat.No.
0.05	With Hardware	5020-10026	5020-10038	-
	Without Hardware	5020-10027	5020-10039	
0.075	With Hardware	5020-10028	5020-10036	
	Without Hardware	5020-10029	5020-10037	
0.2	With Hardware	5020-10033	-	5020-10031
	Without Hardware	5020-10034		

MonoCap Amide



Amide groups are chemically bonded to the monolithic silica and makes it suitable for the analysis of sugars via HILIC mode. As the back pressure is significantly low, a 500 mm length MonoCap Amide column deliver over 40,000 plates offering high efficiency. Generally, HILIC mode uses acetonitrile at a concentration between 65-95 % in an aqueous buffer such as ammonium acetate or ammonium formate, which have high solubility in organic solvents. Columns are protected by either metal or PEEK hardware.

I.D. (mm)	Length (mm)	150	250	500
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.
0.075	Metal	5020-10191	5020-10192	5020-10193
	PEEK	5020-10091	5020-10092	5020-10093
0.1	Metal	5020-10181	5020-10182	5020-10183
	PEEK	5020-10081	5020-10082	5020-10083
0.2	Metal	5020-10171	5020-10172	5020-10173
	PEEK	5020-10071	5020-10072	5020-10073

MonoCap SCX

MonoCap SCX is bonded with benzene sulfonic acid groups (strong cation exchange) and appropriate for 2D LC applications for the separation of biomolecules such as peptides and proteins.

I.D. (mm)	Length (mm)	50	150	250	500
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.	Cat.No.
0.2	Metal	5020-10174	5020-10175	5020-10176	5020-10177
	PEEK	5020-10074	5020-10075	5020-10076	5020-10077

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

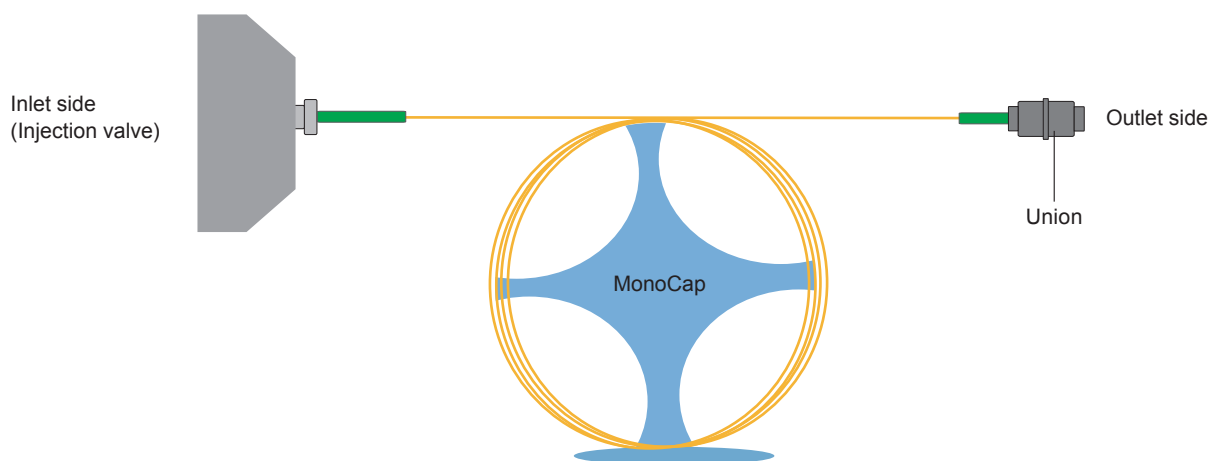
How to Connect MonoCap Columns

How to Connect MonoCap High Resolution Columns

Connect the inlet side of the column to auto sampler or injection valve directly, or from the piping to connect a union.
Using a union to connect with the outlet side of column to detector (UV, MS).
Please use the connection parts or connection kits for capillary LC columns.

Example of how to connect

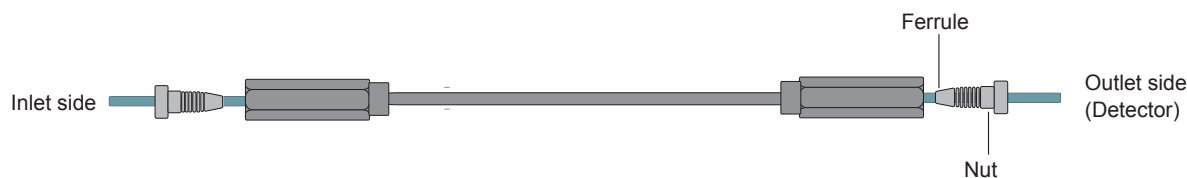
Connect the inlet side directly to injection valve, and the outlet side to the detector via the union.



How to Connect MonoCap (Metal Hardware) Columns

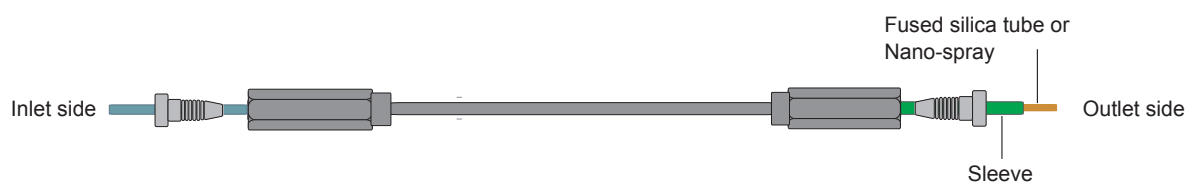
Connect the column inlet side to the piping from the auto sampler and the injection valve.
Connect the column outlet side to detector (UV, MS).

<Example 1>



<Example 2>

If connect to the nano-ion source or directly to nano-spray, tighten the joint with a sleeve.



How to Connect MonoCap (PEEK Hardware) Columns

Connect the column inlet side to the piping from the auto sampler and the injection valve.
Using a union to connect the column outlet side to detector (UV, MS).

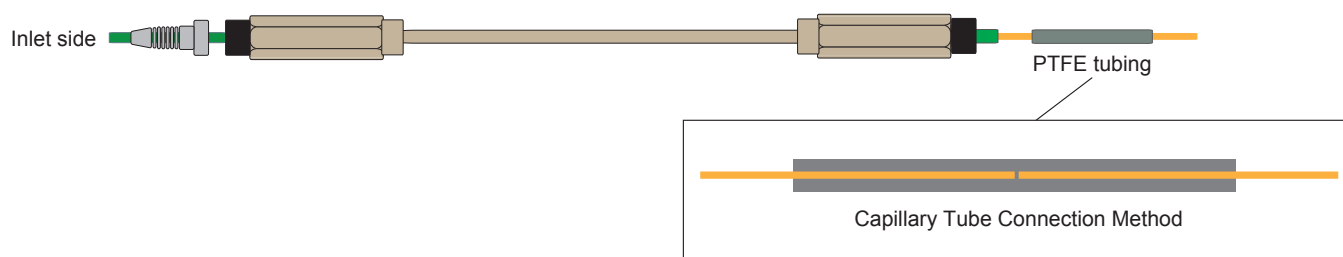
<Example 1>

Connect the column inlet side directly to auto sampler (or injection valve), and connect the outlet side by a union.



<Example 2>

Connect column inlet side to auto sampler (or injection valve) directly, and using a PTFE tubing to connect to fused silica tubing.



Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Connection Kits

Capillary Tubing Connector Kit



For 1/16 inch

Applicable Products	Content	Cat. No.
MonoCap High Resolution MonoCap (Metal columns) Capillary EX-Nano, Capillary -EX	Nut ZN1-10 : 6 pcs Ferrule ZF1PK-10 : 6 pcs Sleeve F-230 (color : grey 40 mm) 6 pcs	5020-10380

For 1/32 inch

Applicable Products	Content	Cat. No.
MonoCap High Resolution MonoCap (Metal columns) Capillary EX-Nano, Capillary -EX	Nut 6 pcs Ferrule : 6 pcs Sleeve (color: nature 40 mm) 6 pcs	5020-10381

Description	Content	Cat.No.
Connection Kit for MonoCap C18 High Resolution 2000	1/16 inch PEEK Ferrule, SUS Nut, Sleeve 2 pcs each 1/32 inch PEEK Ferrule, SUS Nut, Sleeve 2 pcs each	5020-10017

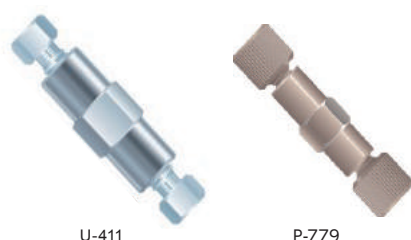
Description	Qty.	Cat. No.
PTFE Tubing 20 mm 2 pcs 1/16 inchO.D. (Connect to 0.375 mm capillary tubing)	10 pcs	5020-10382

Connection Kit for MonoCap C18 Trap Column



Description	Cat.No.
MonoCap C18 Trap Column Connection Kit 1/16 inch (Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each)	5020-10044
MonoCap C18 Trap Column Connection Kit 1/32 inch (Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each)	5020-10045
MonoCap C18 Trap Column Assembly Parts 1/16 inch (Nut·Ferrule 4 pcs each)	5020-10046
MonoCap C18 Trap Column Assembly Parts 1/32 inch (Nut·Ferrule 4 pcs each)	5020-10047

Union



• Specification

Applicable Tubing O.D. : 1/16 inch

Maximum Pressure : 137.8 MPa (1378 bar) : SUS, 41.4 MPa (414 bar) : PEEK

P/N	Description	Screw Type	Orifice Diameter (μm)	Cat.No.
U-435	SUS ZDV Union	10-32UNF	250	6010-72352
U-411	SUS ZDV Union	10-32UNF	178	6010-72351
P-779	PEEK Nano Tight Union	10-32UNF	125	6010-72321

* Fittings are attached



• Specification

Applicable Tubing O.D. : 1/32 inch

Maximum Pressure : 103 MPa (1030 bar) : UH-432, 34.5 MPa (345 bar) : MU.5XCPK

P/N	Description	Screw Type	Orifice Diameter (μm)	Cat.No.
UH-432	Micro Tight Union 1/32 inch	5/16-24 Coned	150	6010-77070
MU.5XCPK	1/32 inch Microvolume Connectors (PEEK)		150	6010-73570

* Fittings are attached



• Specification

Applicable Tubing O.D. : 360 μm

Maximum Pressure : 103 MPa (1030 bar) : SUS

P/N	Description	Screw Type	Orifice Diameter (μm)	Cat.No.
UH-436	Micro Tight Union	5/16-24 Coned	150	6010-77071

* Fittings are attached

Tubing for Capillary Columns

	Applicable Columns' I.D. (mm)	Tubing Size	Length (m)	Qty. (pcs)	Cat. No.
Fused Silica Capillary Tubing	0.05 - 0.3	I.D. : 0.03 mm O.D. : 0.375 mm	0.2	10	5020-10383
			0.3	10	5020-10384
			0.5	10	5020-10385
			1	2	5020-10386
	0.5 - 0.7	I.D. : 0.05 mm O.D. : 0.375 mm	0.2	10	5020-10387
			0.3	10	5020-10388
			0.5	10	5020-10389
			1	2	5020-10390
PEEK Tubing	Applicable Columns' I.D. (mm)	PEEK Tubing	Length (m)	Qty. (pcs)	Cat. No.
	0.05 - 0.7	I.D. : 0.065 mm O.D. : 1/16 inch	0.05	10	5020-10391
			0.1	10	5020-10392
			0.3	10	5020-10393
			0.5	2	5020-10394

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



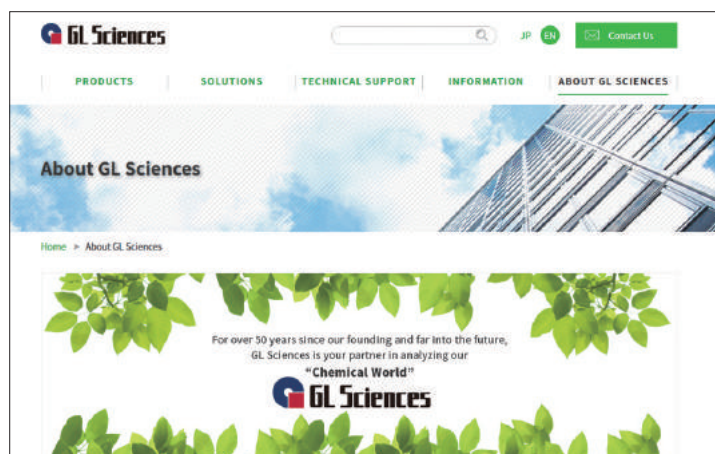
Applications

• Visit our website	162
• Pharmacopeia	163
• Pharmaceuticals	164
• Biochemicals	165
• Foods	166
• Environmental	168
• Pesticides	169
• Vitamins	170
• Others	171

Visit our website

We provide with technical support on our website. You can browse through or search GL Sciences' online library of LC applications, featuring chromatograms with method, conditions, sorted by technique and compound class by InertSearch and Technical Note.

<https://www.glsciences.com/>



InertSearch

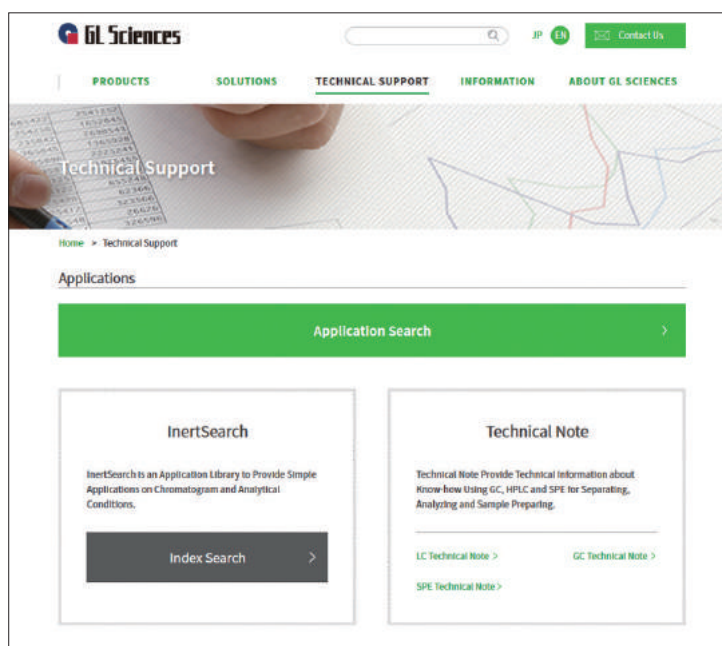
https://www.gls.co.jp/technique/app/inert_search.html

"InertSearch" is GL Sciences' onsite search engine for chromatographic data. A large number of chromatographic results of various analyses are available.

Technical Note

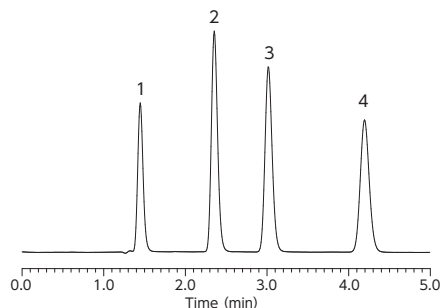
https://www.gls.co.jp/technique/app/lc_technical_note.html

"Technical Note" is a database of chromatographic results and useful information of various analyses. These files provide detailed explanation of each analysis which will help you greatly (e.g. method and instruction, chromatogram with analytic condition, chemical structure of compounds).



Pharmacopeia

p-Hydroxybenzoic acid ethyl ester (JP)

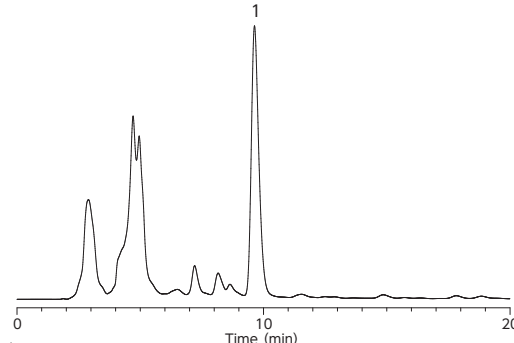


Conditions

Column : Inertsil ODS-4 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 50 mM KH₂PO₄ in H₂O
 A/B = 13/7, v/v
 Flow Rate : 1.3 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : UV 272 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB097, LB098

Sample :
 1. *p*-Hydroxybenzoic acid
 2. *p*-Hydroxybenzoic acid methyl ester
 3. *p*-Hydroxybenzoic acid ethyl ester
 4. *p*-Hydroxybenzoic acid *n*-propyl ester

Alcyrrhiza (JP)

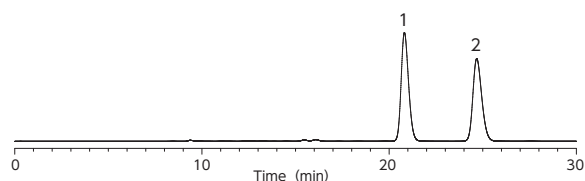


Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN B) 2.1 % CH₃COOH in H₂O
 A/B = 40/60, v/v
 Flow Rate : 0.45 mL/min
 Col. Temp. : 20 $^{\circ}$ C
 Detection : UV 254 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LB182

Sample :
 1. Glycyrrhizic acid

D-Mannitol (JP)

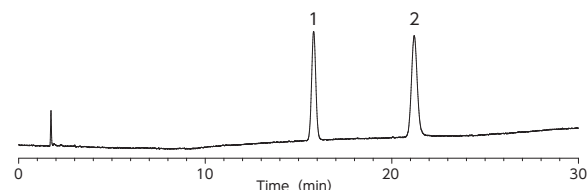


Conditions

Column : HAMILTON HC-75 (Ca²⁺)
 (9 mm, 300 $\times$ 7.8 mm I.D.)
 Eluent : H₂O
 Col. Temp. : 85 $^{\circ}$ C
 Detection : RI (40 $^{\circ}$ C)
 Injection Vol. : 20 μ L
 Flow Rate : 0.5 mL/min
 Data Source : LC Technical Note No. 147

Sample :
 1. D-Mannitol
 2. D-Sorbitol

Polyvinyl alcohol-polyethylene glycol Graft copolymer

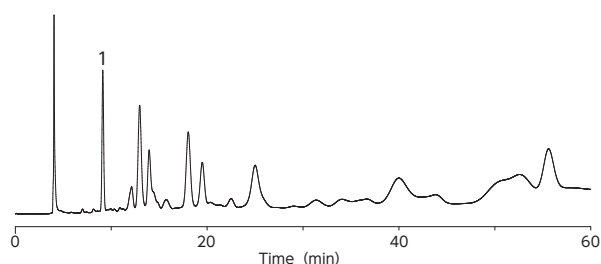


Conditions

Column : InertSustain C18
 (5 μ m, 250 $\times$ 4.0 mm I.D.)
 Eluent : A) H₂O/CH₃CN/CH₃OH = 18/1/1, v/v/v
 B) H₂O/CH₃CN/CH₃OH = 10/9/1, v/v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 30 $^{\circ}$ C
 Detection : UV 205 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB228

Sample :
 1. 1-vinyl-2-pyrrolidone
 2. Vinyl acetate

Povidone (JP)

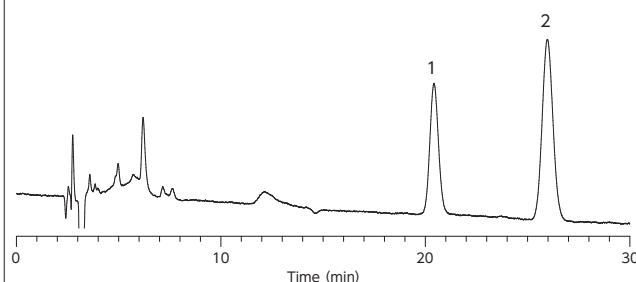


Conditions

Column : Hamilton HC-75 (H⁺) 79642P
 (9 μ m, 300 $\times$ 7.8 mm I.D.)
 Eluent : 0.1 % Perchloric acid in H₂O
 Flow Rate : 1.0 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : UV 210 nm
 Injection Vol. : 50 μ L
 Data Source : LC InertSearch No. LB434

Sample :
 1. Formic acid

Tranexamic Acid (JP)



Conditions

Column : InertSustain AQ-C18 (5 μ m, 250 $\times$ 6.0 mm I.D.)
 Eluent : A) CH₃OH
 B) Phosphate Buffer (pH = 2.5)
 A/B = 40/60, v/v
 Flow Rate : 1.4 mL/min
 Col. Temp. : 25 $^{\circ}$ C
 Detection : UV 220 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No.92

Sample :
 1. Tranexamic acid (200 mg/L)
 2. 4-Aminobenzoic acid methyl ester (2 mg/L)

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

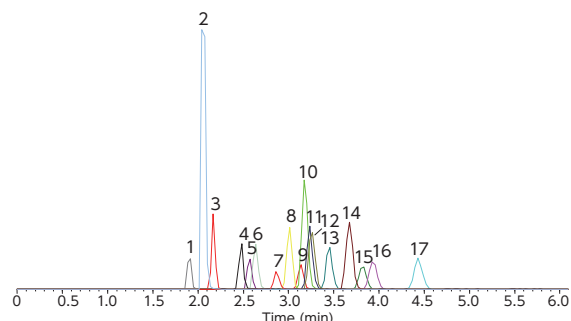
Capillary Columns

Applications

Cat. No. Index

Pharmaceuticals

Analysis of 17 Anti-depressant Drugs

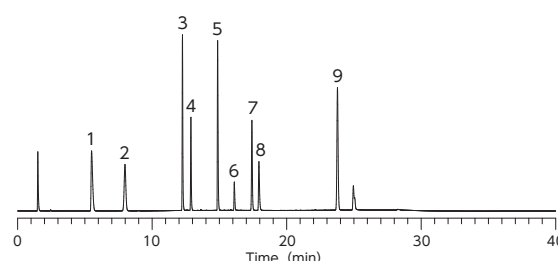


Conditions

Column : InertSustain C18 HP (3 μ m, 150 $\times$ 2.1 mm I.D.)
 Eluent : A) 0.1 % HCOOH in CH₃CN
 B) 0.1 % HCOOH in H₂O
 A/B = 2/98 - 0.5 min - 40/60
 - 5.5 min - 40/60, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LA908

Sample :
 1. Sulpiride 10. Imipramine
 2. Milnacipran 11. Nortriptyline
 3. Trazodone 12. Maprotiline
 4. Mianserin 13. Amitriptyline
 5. Amoxapine 14. Trimipramine
 6. Doxepin 15. Fluoxetine
 7. Paroxetine 16. Sertraline
 8. Desipramine 17. Clomipramine
 9. Fluvoxamine (100 ng/mL each)

Analysis of 9 Drugs

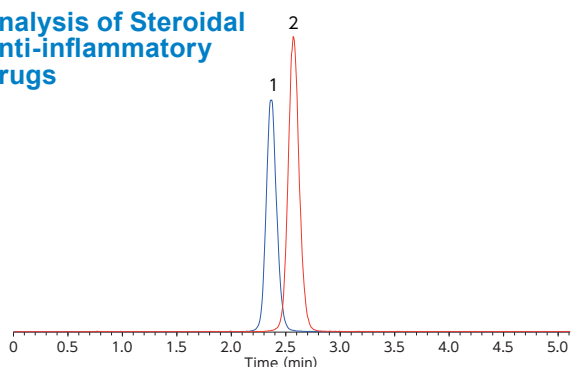


Conditions

Column : InertSustain C18 (3 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM KH₂PO₄ in H₂O (pH 7.0, 10 mM K₂HPO₄ in H₂O)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 220 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB400

Sample :
 1. Acetylsalicylic acid
 2. Acetaminophen
 3. Caffeine
 4. Ranitidine
 5. Ketoprofen
 6. Berberine hydrochloride
 7. Chlorpromazine
 8. Dextromethorphan
 9. Amitriptyline (50 mg/L each)

Analysis of Steroidal Anti-inflammatory Drugs

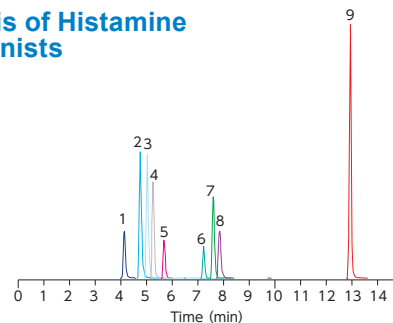


Conditions

Column : InertSustain Phenyl (2 μ m, 50 $\times$ 2.1 mm I.D.)
 Eluent : A) CH₃OH/HCOOH = 100/0.05, v/v
 B) H₂O/HCOOH = 100/0.05, v/v
 A/B = 40/60, v/v
 Flow Rate : 0.6 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB198

Sample :
 1. Hydrocortisone
 2. Prednisolone (0.1 mg/L each)

Analysis of Histamine Antagonists

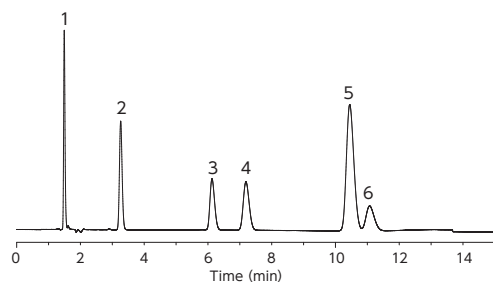


Conditions

Column : Inertsil ODS-4 (3 μ m, 150 $\times$ 2.1 mm I.D.)
 Eluent : A) CH₃OH
 B) 2 mM CH₃COONH₄
 A/B = 40/60 - 10 min - 95/5
 - 2 min - 95/5, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA678

Sample :
 1. Chlorpheniramine 6. Diphenylpyraline
 2. Cinnarizin 7. Hydroxyzine
 3. Clemastine 8. Promethazine
 4. Difenedol 9. Triprolidine
 5. Diphenhydramine (0.1 mg/L each)

Analysis of β -blocker

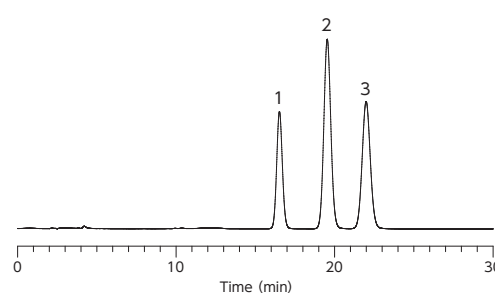


Conditions

Column : InertSustain AQ-C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN B) 0.1 % H₃PO₄ in H₂O
 A/B = 25/75, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 220 nm
 Injection Vol. : 1 μ L
 Data Source : LC InertSearch No. LB362

Sample :
 1. Atenolol
 2. Acebutolol
 3. Oxprenolol
 4. Labetalol
 5. Propranolol
 6. Alprenolol (100 μ g/mL each)

Analysis of Nonsteroidal Anti-inflammatory Drug



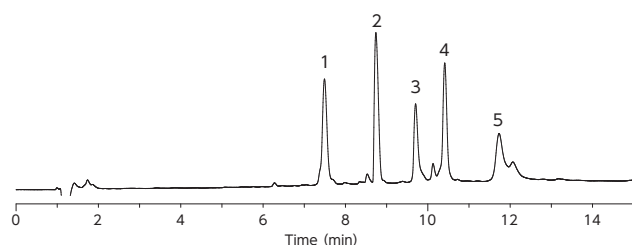
Conditions

Column : InertSustain Phenylhexyl (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 25 mM KH₂PO₄ in H₂O (pH = 3.0, H₃PO₄)
 A/B = 60/40, v/v
 Flow Rate : 0.8 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 230 nm
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB421

Sample :
 1. Ibuprofen
 2. Diclofenac sodium
 3. Indomethacin

Biochemicals

Protein

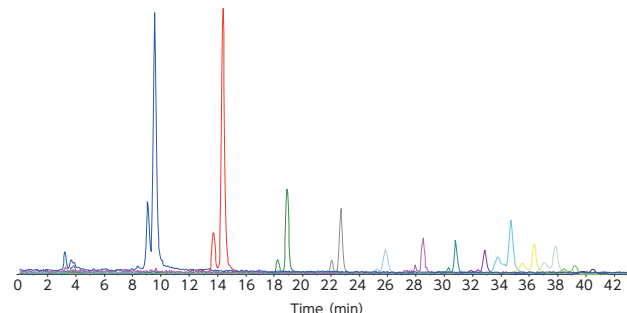


Conditions

Column : MonoCap C18 Fast-Flow (150 mm × 0.2 mm I.D.)
 Eluent : A) 0.1 % TFA in CH₃CN
 B) 0.1 % TFA in H₂O
 A/B = 20/80 - 10 min - 60/40-15 min - 60/40
 Flow Rate : 5 µL/min
 Injection vol. : 0.3 µL
 Col. Temp. : ambient
 Detection : UV 210 nm

Sample :
 1. Ibonuclease A
 2. Insulin
 3. Cytochrome C
 4. Lysozyme
 5. BSA

PA-Glucose Oligomer

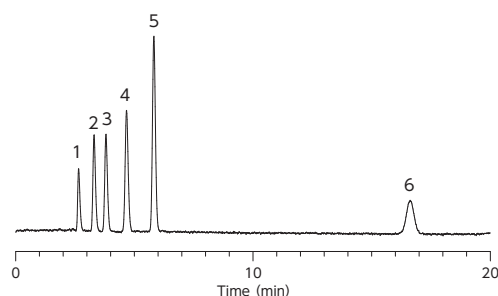


Conditions

Column : MonoCap Amide (250 mm × 0.2 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM CH₃COONH₄ in H₂O
 A/B = 80/20 - 20 min - 60/40, v/v
 Flow Rate : 2 mL/min
 Col. Temp. : ambient
 Detection : Nano-ESI
 Injection vol. : 100 nL

Sample :
 PA-Glucose oligomer

Analysis of ATP related Compounds

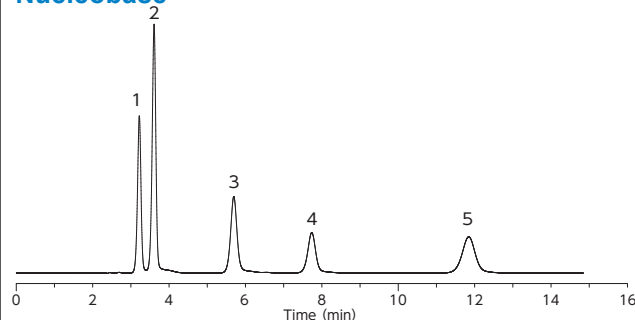


Conditions

Column : InertSustain AQ-C18
 (5 µm, 150 × 4.6 mm I.D.)
 Eluent : 50 mM K₂HPO₄ in H₂O
 (pH 7.0, H₃PO₄)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 260 nm
 Injection Vol. : 1 µL
 Data Source : LC InertSearch No. LB380

Sample :
 1. Inosinic acid
 2. Adenosine triphosphate
 3. Adenosine diphosphate
 4. Adenosine monophosphate
 5. Hypoxanthine
 6. Inosine
 (5 mg/L each)

Nucleobase

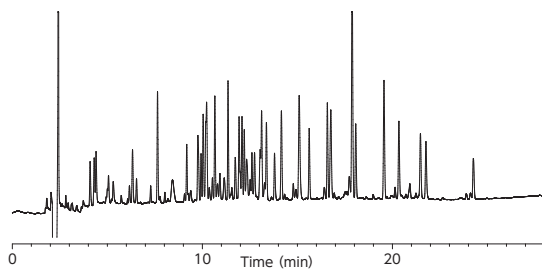


Conditions

Column : InertSustain Amide
 (5 µm, 150 × 2.1 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM HCOONH₄ in H₂O
 A/B = 90/10, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm

Sample :
 1. Tyrimine
 2. Uracil
 3. Adenine
 4. Cytosine
 5. Guanine

Analysis of BSA Digests

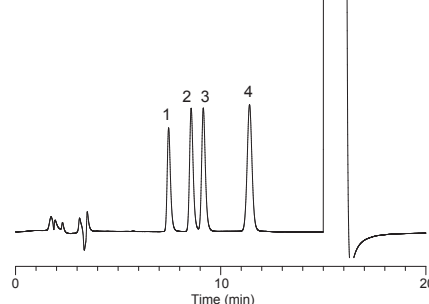


Conditions

Column : InertSustainSwift C18
 (1.9 µm, 150 × 2.1 mm I.D.)
 Eluent : A) 0.1% TFA in CH₃CN
 B) 0.1% TFA in H₂O
 A/B = 10/90 - 30 min - 50/50 - 0.1 min - 90/10
 - 5 min - 90/10 - 0.1 min - 10/90 - 15 min
 Flow Rate : 0.2 mL/min
 Col. Temp. : 40 °C
 Detection : UV 210 nm
 Injection Vol. : 10 µL
 Data Source : LC InertSearch No. LB438

Sample :
 Tryptic Digest of BSA (0.5 mg/mL)

Catecholamine in Urine



Conditions

Column : Inertsil ODS-4
 (5 µm, 250 × 3.0 mm I.D.)
 Eluent : A) Acetate-citrate buffer *
 B) CH₃CN
 A/B = 100/16, v/v
 Flow Rate : 0.5 mL/min
 Col. Temp. : 35 °C
 Detection : ECD 800 mV vs. Ag/AgCl
 Injection Vol. : 20 µL
 Data Source : LC Technical Note No. 93

Sample :
 1. Norepinephrine (NE)
 2. Epinephrine (E)
 3. 3,4-dihydroxybenzylamine (DHBA, I.S.)
 4. Dopamine (DA)
 (100 ng/mL in 0.1 % Acetic acid solution each)

* : Acetate-citrate buffer :
 Dissolve 0.82 g of anhydrous sodium acetate, 2.10 g of
 citric acid monohydrate and 0.50 g of sodium
 1-octanesulfonate in 500mL of H₂O.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

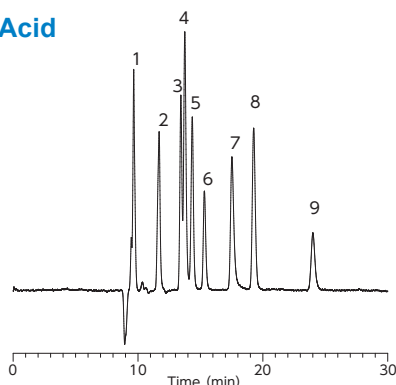
Capillary Columns

Applications

Cat. No. Index

Foods

Organic Acid

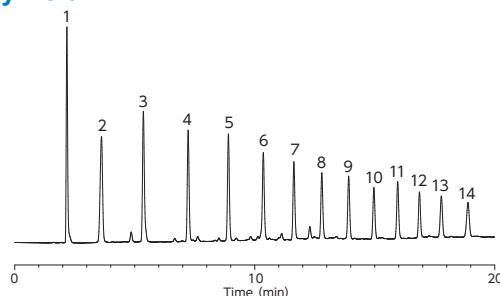


Conditions

Column : Inertsil Ph-3 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 + Inertsil CX (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : 3 mM HClO₄ in H₂O
 Reaction Reagent : 0.1 mM BTB + 30 mM Na₂HPO₄ in H₂O
 Flow Rate : 0.5 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : VIS 440 nm
 Injection Vol. : 10 μ L
 Data Source : LC Technical Note No. 24

Sample :
 1. Phosphoric acid
 2. Tartaric acid
 3. Malic acid
 4. Formic acid
 5. Citric acid
 6. Lactic acid
 7. Acetic acid
 8. Succinic acid
 9. Pyroglutamic acid
 (1 mg/mL each)

Fatty Acid

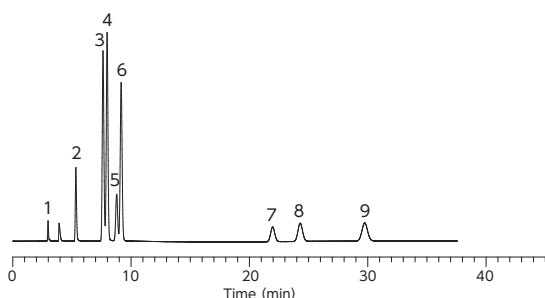


Conditions

Column : InertSustain C18
 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) 0.1 % H₃PO₄ in CH₃CN
 B) 0.1 % H₃PO₄ in H₂O
 A/B = 10/90 -15 min
 - 90/10 -10 min - 90/10, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 210 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA901

Sample :
 1. Acetic acid (C2)
 2. Propionic acid (C3)
 3. Butyric acid (C4)
 4. Valeric acid (C5)
 5. Caproic acid (C6)
 6. Enanthic acid (C7)
 7. Caprylic acid (C8)
 8. Pelargonic acid (C9)
 9. Capric acid (C10)
 10. Undecanoic acid (C11)
 11. Lauric acid (C12)
 12. Tridecanoic acid (C13)
 13. Myristic acid (C14)
 14. Pentadecanoic acid (C15)
 (1 mg/mL each)

Preservative · Sweetner

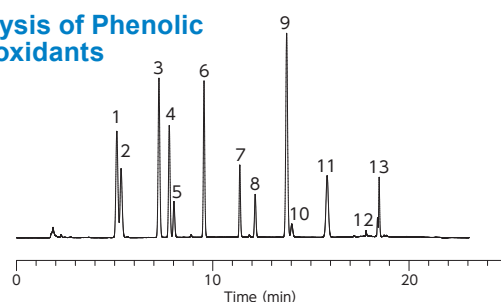


Conditions

Column : InertSustain Phenylhexyl
 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 0.1% H₃PO₄ in H₂O
 A/B = 15/85, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 210 nm (GL-7452 PDA Detector)
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB238

Sample :
 1. Ascorbic acid
 2. Acesulfame potassium
 3. Saccharin sodium
 4. Caffeine
 5. Aspartame
 6. p-Hydroxybenzoic acid
 7. Sorbic acid
 8. Benzoic acid
 9. Dehydroacetic acid
 (10 mg/L each)

Analysis of Phenolic Antioxidants

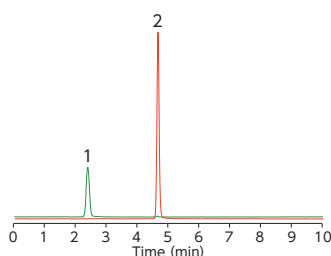


Conditions

Column : InertSustainSwift C18 HP
 (3 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN/CH₃OH = 1/1, v/v
 B) 5 % CH₃COOH in H₂O
 A/B = 30/70 - 2 min - 30/70 - 8 min
 - 58/42 - 13 min - 58/42 - 15 min
 - 100/0 - 18 min - 100/0 - 18.1 min
 - 30/70 - 25 min - 30/70, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 280 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB405

Sample :
 1. Propyl gallate (PG)
 2. 3,4-Dihydroxybenzoic acid (DHBA)
 3. 2,4,5-Trihydroxybutyrophenone (THBP)
 4. Butyl gallate (BG)
 5. tert-Butylhydroquinone (TBHQ)
 6. Isoamyl gallate (IAG)
 7. Nordihydroguaiaretic acid (NDGA)
 8. Butylated hydroxyanisole (BHA)
 9. 4-Hexylresorcinol (HR)
 10. 4-Hydroxymethyl-2,6-di-tert-butylphenol (HMBP)
 11. Octyl gallate (OG)
 12. Dibutylhydroxytoluene (BHT)
 13. Dodecyl gallate (DG) (10 mg/L each)

Melamine

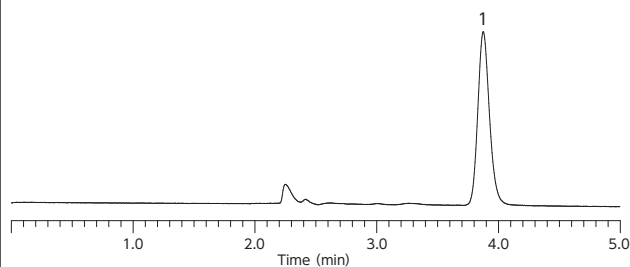


Conditions

Column : Inertsil HILIC (5 μ m, 150 $\times$ 3.0 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM CH₃COONH₄ in H₂O
 A/B = 90/10 - 0.5 min - 90/10
 - 5.5 min - 50/50, v/v
 Flow Rate : 0.5 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
 Injection Vol. : 5.0 μ L
 Data Source : LC Technical Note No.132

Sample :
 1. Cyanoguanidine (20 μ g/L)
 2. Melamine (10 μ g/L)

Oxalic Acid



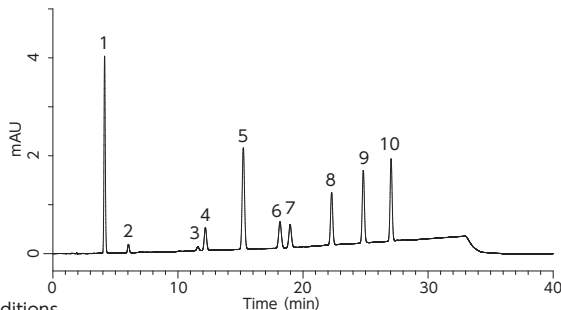
Conditions

Column : InertSustain Amide (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 30 mM Na₂HPO₄ in H₂O (pH 6.8)
 A/B = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 220 nm
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB466

Sample :
 1. Oxalic acid (100 mg/L)

Foods

Catechin in Tea

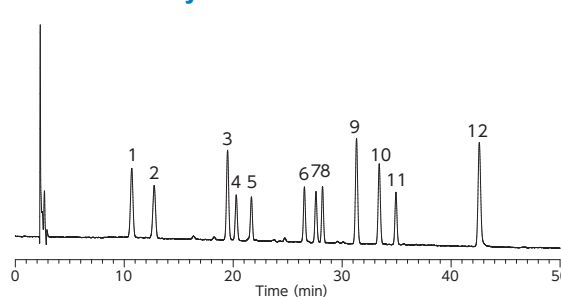


Conditions

Column : Inertsustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH/CH₃CN = 9/1, v/v
 B) 0.1 % H₃PO₄ in H₂O (pH 2.1)
 A/B = 10/90 - 15 min - 20/80 - 30 min
 - 40/60 - 30.1 min - 10/90 - 40 min
 - 10/90, v/v
 Flow Rate : 1.0 mL/min
 Col.Temp : 40 $^{\circ}$ C
 Detection : UV 280 nm
 Injection Vol. : 10 μ L
 Data Source : LC Technical Note No. 145

Sample :
 1. Gallic acid (GA)
 2. Gallocatechin (GC)
 3. Epigallocatechin (EGC)
 4. Catechin (C)
 5. Caffeine
 6. Epigallocatechin gallate (EGCG)
 7. Epicatechin (EC)
 8. Gallocatechin gallate (GCG)
 9. Epicatechin gallate (ECG)
 10. Catechin gallate (CG)
 (1 mg/L each)

Isoflavone in Soybean

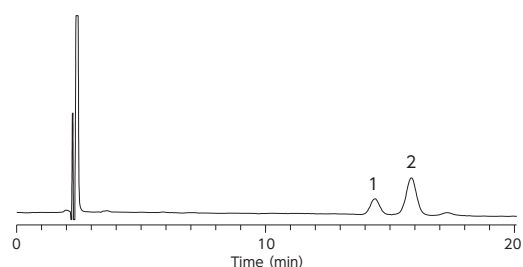


Conditions

Column : Inertsil ODS-SP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) 0.1 % CH₃COOH in CH₃CN
 B) 0.1 % CH₃COOH in H₂O
 A/B = 15/85 - 8 min
 - 15/85 - 42 min - 35/65, v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : PDA 254 nm
 Injection : 10 μ L
 Data Source : LC Technical Note No. 66

Sample :
 1. Daidzin (D)
 2. Glycitin (GI)
 3. Genistin (G)
 4. 6'-o-Malonyldaidzin (MD)
 5. 6'-o-Malonylglycitin (MGI)
 6. 6'-o-Acetyldaidzin (AD)
 7. 6'-o-Acetylglycitin (AGI)
 8. 6'-o-Malonylgenistin (MG)
 9. Daizein (De)
 10. Glycitein (Gle)
 11. 6'-o-Acetylgenistin (AG)
 12. Genistein (Ge)
 (10 mg/L each)

Carotene in Carrot Juice

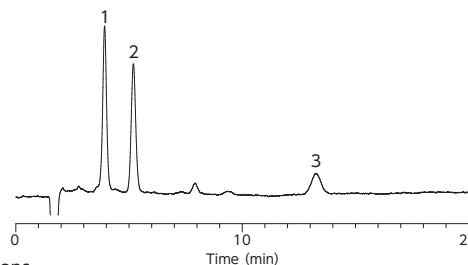


Conditions

Column : Inertsil ODS-SP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) Ethanol
 A/B = 90/10, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : VIS 455 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No.28

Sample :
 1. α -Carotene
 2. β -Carotene

Tetracycline



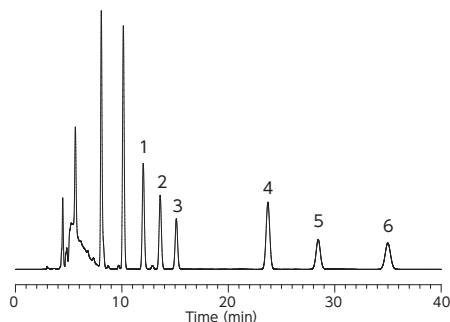
Conditions

Column : Inertsustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) Imidazole buffer*
 A/B = 20/80, v/v (Premix)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 380 nm Em 520 nm
 Injection Vol. : 20 μ L

Sample :
 1. Oxytetracycline
 2. Tetracycline
 3. Chlortetracycline
 (1 mg/L each)

* Imidazole buffer :
 Dissolve 68.08 g of imidazole, 0.37 g of disodium ethylenediaminetetraacetate and 10.72 g of magnesium acetate in 800 mL of H₂O. Adjust to pH 7.2 with acetic acid and dilute this solution to 1,000 mL with H₂O.

Analysis of Non-volatile Corruption Amine



Conditions

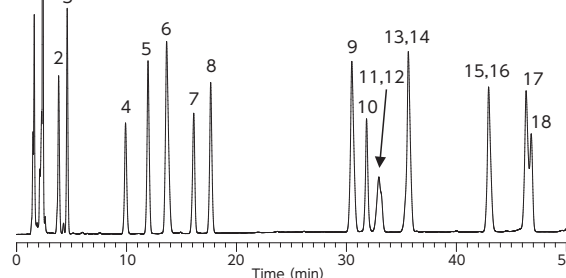
Column : Inertsil ODS-SP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Guard Column : Inertsil ODS-SP (5 μ m, 10 $\times$ 4.0 mm I.D.)
 Eluent : A) CH₃CN B) H₂O A/B = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 325 nm Em 525 nm
 Injection : 10 μ L
 Data Source : LC Technical Note No. 48

Sample :
 1. Putrescine (5 mg/L)
 2. Cadaverine (5 mg/L)
 3. Histamine (100 mg/L)
 4. 1,8-Diaminooctane (10 mg/L)
 5. Tyramine (25 mg/L)
 6. Spermidine (5 mg/L)

Analysis of Food Dyes

Conditions

Column : Inertsil ODS-3 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM Na₂HPO₄ in H₂O
 A/B = 10/90 - 50 min - 35/65, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 270 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA509

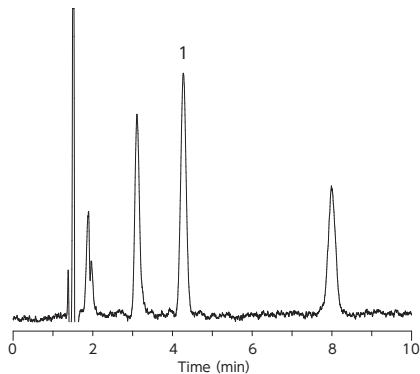


Sample :

1. Tartrazine (Food Yellow No. 4, 7.6 mg/L)
 2. Amaranth (Food Red No. 2, 3.8 mg/L)
 3. Ingigocarmine (Food Blue No. 2, 7.6 mg/L)
 4. New coccine (Food Red No. 102, 3.8 mg/L)
 5. Sunset Yellow FCF (Food Yellow No. 5, 5.3 mg/L)
 6. Naphthol Yellow S (7.6 mg/L)
 7. Uranine (3.8 mg/L)
 8. Allura red AC (5.3 mg/L)
 9. Ponceau R (7.6 mg/L)
 10. Ponceau SX (5.3 mg/L)
 11. Orange I (5.3 mg/L)
 12. Fast green FCF (Food Green No. 3, 3.0 mg/L)
 13. Brilliant blue FCF (Food Blue No. 1, 3.0 mg/L)
 14. Ponceau 3R (7.6 mg/L)
 15. Erythrosine (Food Red No. 3, 5.3 mg/L)
 16. Azure Blue VX (Sulfan blue, 3.0 mg/L)
 17. Orange II (7.6 mg/L)
 18. Acid red (Food Red No. 106, 3.0 mg/L)

Environment

Analysis of Non-ionic Surfactant

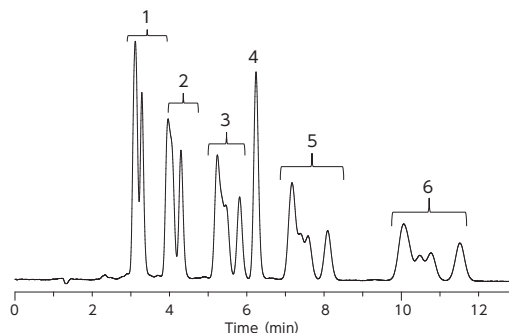


Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH B) 10 mM Na₂B₄O₇ in H₂O A/B = 38/62, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 510 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LA974

Sample :
 1. Heptaoxyethylene dodecyl ether
 [Deriv.](0.002 mg/L)

Analysis of Anionic Surfactant

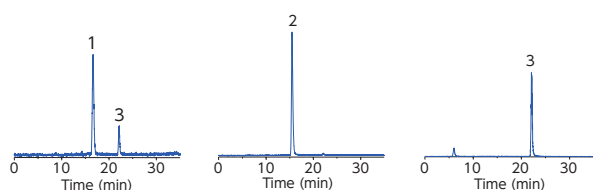


Conditions

Column : Inertsil ODS-3 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : 0.1 M NaClO₄ in CH₃CN/H₂O = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 221 nm Em 284 nm
 Injection Vol. : 10 μ L
 Data Source : LC Technical Note No. 102

Sample :
 1. Sodium Decylbenzenesulfonate(C10)
 2. Sodium Undecylbenzenesulfonate(C11)
 3. Sodium Dodecylbenzenesulfonate(C12)
 4. Toluene
 5. Sodium Tridecylbenzenesulfonate(C13)
 6. Sodium Tetradecylbenzenesulfonate(C14)
 (1 mg/L each)

Haloacetic Acids

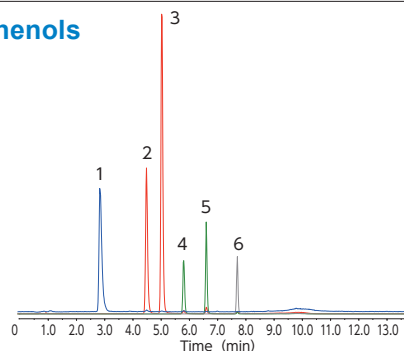


Conditions

Column : InertSustain C18 (3 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH B) 0.2 % HCOOH in H₂O
 A/B = 5/95 - 38 min - 100/0
 -12 min - 100/0, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 30 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
 Injection Vol. : 100 μ L
 Data Source : LC Technical Note No. 125

Sample :
 1. Monochloroacetic acid (MCAA) (2 μ g/L)
 2. Dichloroacetic acid (DCAA) (4 μ g/L)
 3. Trichloroacetic acid (TCAA) (20 μ g/L)

Chlorophenols

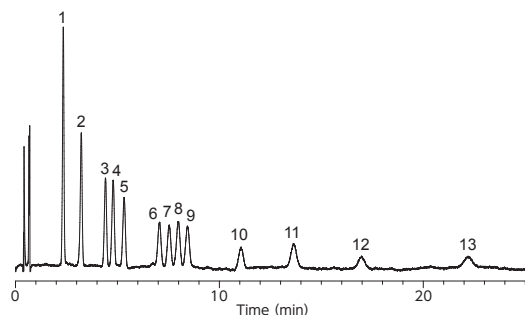


Conditions

Column : InertSustain C18 HP (3 μ m, 100 $\times$ 2.1 mm I.D.)
 Eluent : A) CH₃OH, B) H₂O
 A/B = 40/60-8 min-90/10-0.5 min-90/10-0.1 min-40/60-5 min, v/v
 Flow Rate : 0.3 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS
 Injection Vol. : 25 μ L
 Data Source : LC Technical Note No. 149

Sample :
 1. Phenol
 2. 2-chlorophenol
 3. 4-chlorophenol
 4. 2,6-dichlorophenol
 5. 2,4-dichlorophenol
 6. 2,4,6-trichlorophenol
 (0.83 μ g / L each)

DNPH Aldehydes

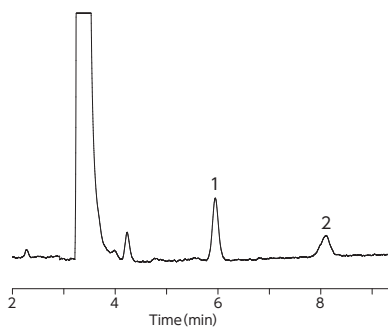


Conditions

Column : InertSustain C18 HP (3 μ m, 150 $\times$ 3.0 mm I.D.)
 Eluent : A) CH₃CN B) THF C) H₂O
 A/B/C = 35/10/55, v/v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 360 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA962

Sample :
 1. DNPH-Formaldehyde 8. DNPH-Methacrolein
 2. DNPH-Acetaldehyde 9. DNPH-n-Butyraldehyde
 3. DNPH-Acetone 10. DNPH-Benzaldehyde
 4. DNPH-Acroline 11. DNPH-n-Valeraldehyde
 5. DNPH-Propionaldehyde 12. DNPH-m-Tolualdehyde
 6. DNPH-Crotonaldehyde 13. DNPH-Hexanal
 7. DNPH-Methylethylketone (150 μ g/L each)

Formaldehydes in Water



Conditions

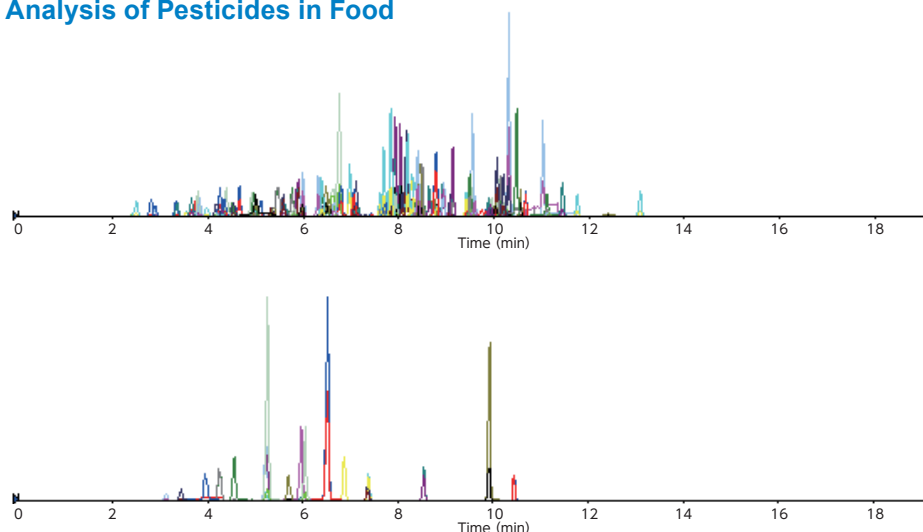
Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN B) H₂O
 A/B = 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 360 nm
 Injection Vol. : 10 μ L

Sample :
 1. DNPH-Formaldehyde
 2. DNPH-Acetaldehyde
 (5 μ g/L each)

Pesticides

Analysis of Pesticides in Food

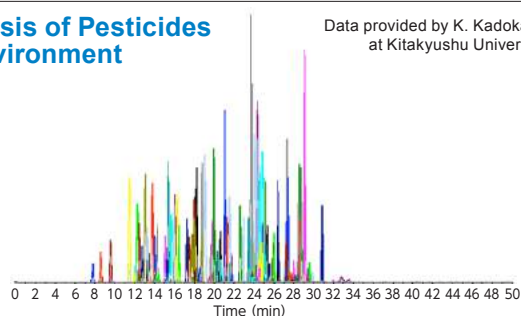
Data provided by AB Sciex



Conditions

Column : InertSustain C18
(2 μ m, 100 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃OH
B) 2 mM CH₃COONH₄ in H₂O
A/B = 5/95 - 0.5 min - 30/70 - 9.5 min
- 95/5 - 5 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col.Temp. : 40 $^{\circ}$ C
Detection : LC/MS/MS
(4000 QTRAP : ESI, MRM)
Injection Vol. : 10 μ L
Data Source : LC Technical Note No. 129

Analysis of Pesticides in Environment

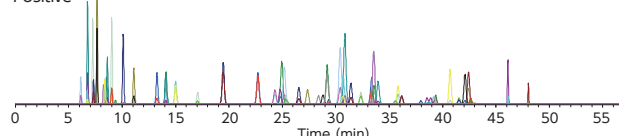
Data provided by K. Kadokami
at Kitakyushu University

Conditions

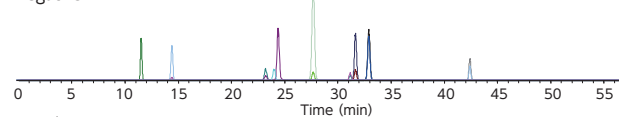
Column : Inertsil ODS-4 HP (3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) 5 mM CH₃COONH₄ in CH₃OH
B) 5 mM CH₃COONH₄ in H₂O
A/B = 5/95 - 30 min - 95/5 - 20 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 $^{\circ}$ C
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 2.5 μ L
Data Source : LC InertSearch No. LA 843

Analysis of Pesticides in Water

Positive



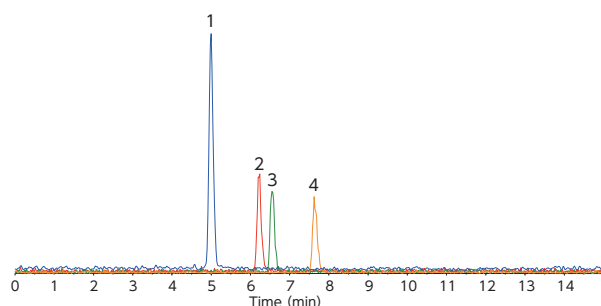
Negative



Conditions

Column : InertSustain C18 (3 μ m, 75 $\times$ 2.1 mm I.D.)
Eluent : A) 5 mM CH₃COONH₄ in CH₃OH B) 5 mM CH₃COONH₄ in H₂O
A/B = 5/95 - 4 min - 40/60 - 35 min - 75/25 - 5 min - 100/0 - 6 min, v/v
Flow Rate : 0.15 mL/min
Col.Temp. : 40 $^{\circ}$ C
Sample.Temp. : 5 $^{\circ}$ C
Detection : LC/MS/MS (4000 QTRAP : ESI, MRM)
Injection Vol. : 100 μ L
Data Source : LC Technical Note No.135

Pesticides

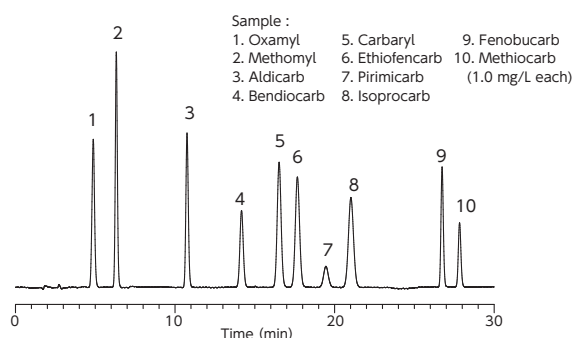


Conditions

Column : InertSustain Phenyl (3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) 0.1 % HCOOH in CH₃CN
B) 0.1 % HCOOH in H₂O
A/B = 40/60 - 10 min - 70/30 - 0.01 min - 40/60
- 5 min - 40/60, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 $^{\circ}$ C
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 5 μ L
Data Source : LC InertSearch No. LB077

Sample :
1. Paclobutrazole
2. Diniconazole
3. Propiconazole
4. Dificonazole
(1 μ g/L each)

Analysis of Carbamate Insecticides



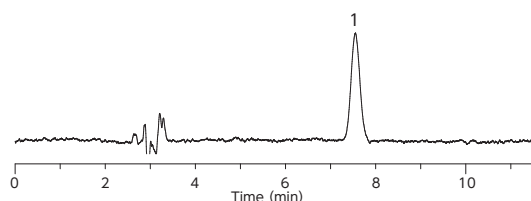
Conditions

Column : InertSustain C18 (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃OH B) H₂O
A/B = 35/65 - 2 min - 35/65 - 0.1 min - 53/47 - 18.4 min - 53/47 - 0.1 min
- 70/30 - 9.4 min - 70/30 - 0.1 min - 35/65 - 9.9 min - 35/65, v/v
Reaction Reagent : OPA reagent
Flow Rate : 1.0 mL/min
Col. Temp. : 40 $^{\circ}$ C
Detection : FL Ex 339 nm Em 455 nm(0 - 18.5 min), Ex 312 nm Em 382 nm(18.6 - 20.1 min),
Ex 339 nm Em 455 nm(20.2 - 30 min)
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA916

Sample :
1. Oxamyl 5. Carbaryl 9. Fenobucarb
2. Methomyl 6. Ethiofencarb 10. Methiocarb
3. Aldicarb 7. Pirimicarb (1.0 mg/L each)
4. Bendiocarb 8. Isoprocarb

Vitamins

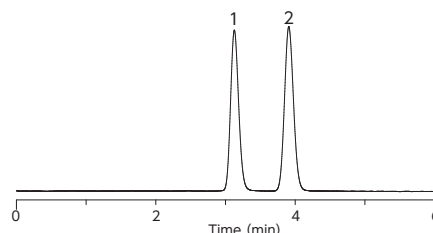
Vitamin A



Conditions

Column : Inertsil ODS-3 (5 μ m, 250 $\times$ 4.6 mm I.D.) Sample :
 Eluent : A) CH₃OH 1. Retinol (50 μ g/L)
 B) H₂O
 A/B = 95/5, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 325 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No. 32

Vitamin B1

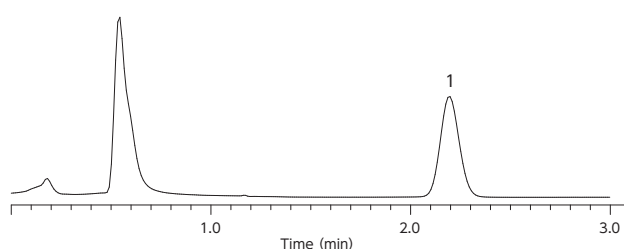


Conditions

Column : Inertsil ODS-3 (5 mm, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 0.01 M NaH₂PO₄,
 0.15 M NaClO₄ in H₂O (pH 2.2)
 A/B = 1/9, v/v
 Reaction Reagent : 0.05 w/v % potassium ferricyanide
 +15 w/v % NaOH, 0.4 mL/min
 Flow Rate : 1.0 mL/min
 Col.Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 375 nm Em 440 nm
 Injection Vol : 20 μ L
 Data Source : LC Technical Note No. 143

Sample :
 1. Thiamine
 2. Hydroxyethylthiamine (HET)
 (50 mg/L each)

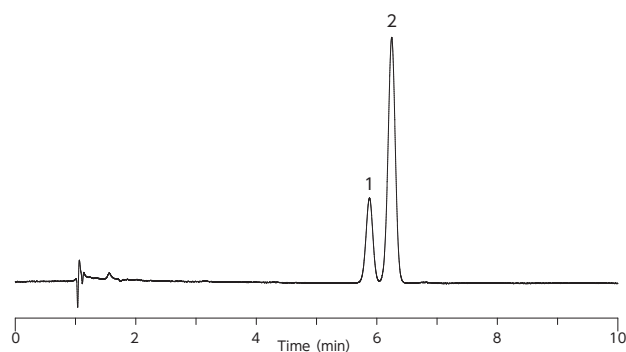
Vitamin C



Conditions

Column : InertSustain Amide (5 μ m, 150 $\times$ 3.0 mm I.D.) Sample :
 Eluent : A) CH₃CN 1. Ascorbic acid
 B) 0.1 % H₃PO₄ in H₂O
 A/B = 87/13, v/v
 Flow Rate : 0.8 mL / min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 243 nm
 Injection Vol. : 2 μ L

Vitamin D2, D3

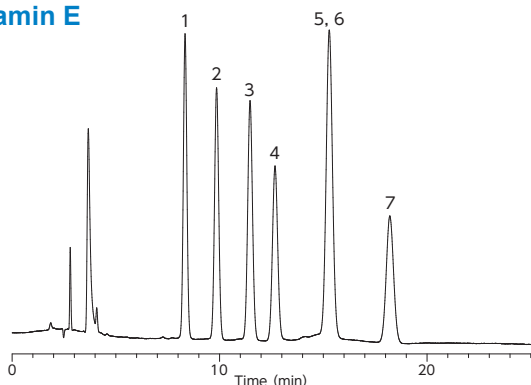


Conditions

Column : Inertsil ODS-HL (3 μ m, 150 $\times$ 2.1 mm I.D.)
 Eluent : CH₃OH
 Flow Rate : 0.3 mL/min
 Col. Temp. : 25 $^{\circ}$ C
 Detection : UV 265 nm
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB467

Sample :
 1. Vitamin D2
 2. Vitamin D3
 (5 mg/L each)

Vitamin E

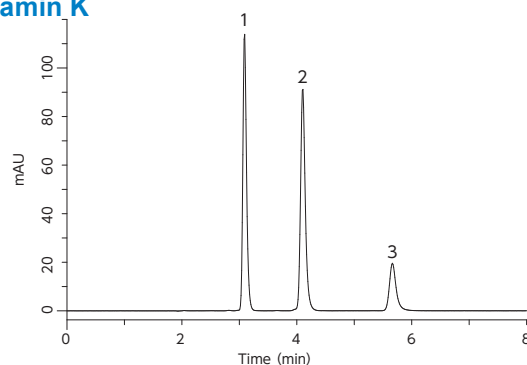


Conditions

Column : Inertsil ODS-HL (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : CH₃OH
 Flow Rate : 1.0 mL/min
 Col. Temp. : 30 $^{\circ}$ C
 Detection : UV 210 nm
 Injection Vol. : 5 μ L

Sample :
 1. δ -Tocotrienol
 2. γ -Tocotrienol
 3. α -Tocotrienol
 4. δ -Tocopherol
 5. β -Tocopherol
 6. γ -Tocopherol
 7. α -Tocopherol
 (10 mg/L each)

Vitamin K



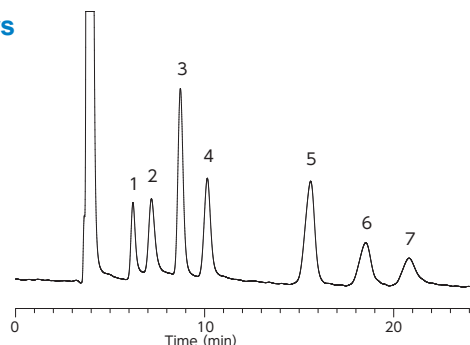
Conditions

Column : InertSustainSwift C8 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : CH₃CN
 Flow rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 270 nm
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB468

Sample :
 1. Vitamin K2 (MK-4)
 2. Vitamin K1
 3. Vitamin K2 (MK-7)
 (50 mg/L each)

Others

Sugars

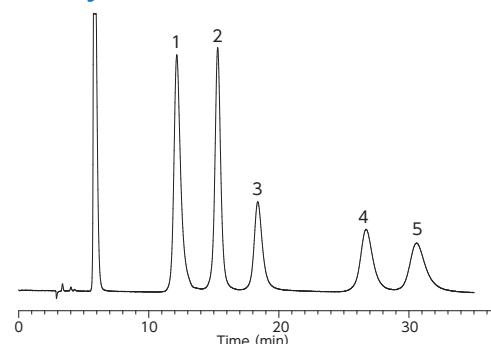


Conditions

Column : InertSustain NH2 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) H₂O
 A/B = 85/15, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : RI
 Injection Vol.: 10 μ L
 Data Source : LC InertSearch No. LB180

Sample :
 1. Rhamnose
 2. Fucose
 3. Fructose
 4. Glucose
 5. Sucrose
 6. Maltose
 7. Lactose
 (10 mg/mL each)

Sugar analysis with ECD

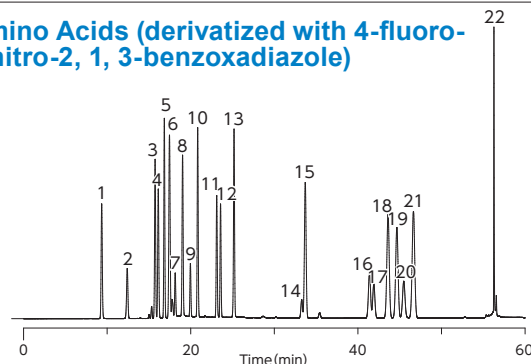


Conditions

Column : InertSphere Sugar-1 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : 100 mM NaOH* in H₂O
 Flow Rate : 0.5 mL/min
 Col. Temp. : 25 $^{\circ}$ C
 Detection : ECD Pulse Mode
 Injection Vol.: 10 μ L
 Data Source : LC Technical Note No. 101

Sample :
 1. Fucose
 2. Glucose
 3. Fructose
 4. Lactose
 5. Sucrose
 (10 mg/L each)

Amino Acids (derivatized with 4-fluoro-7-nitro-2, 1, 3-benzoxadiazole)



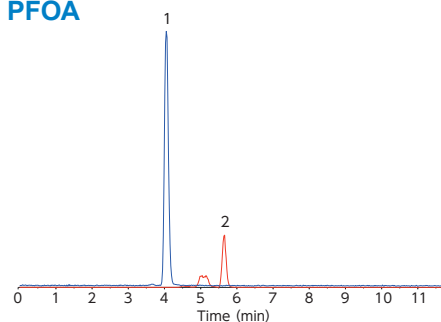
Conditions

Column : InertSustainSwift C18 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) 0.1 % TFA in CH₃CN
 B) 0.1 % TFA in H₂O
 A/B = 10/90 - 5 min - 10/90 - 20 min
 - 30/70 - 50 min - 35/65 - 50.1 min
 - 80/20 - 55 min - 80/20 - 55.1 min
 - 10/90 - 70 min - 10/90, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 470 nm Em 530 nm
 Injection Vol.: 5 μ L

Sample :
 1. NBD-Taurine
 2. NBD-Histidine
 3. NBD-Glutamine
 4. NBD-Serine
 5. NBD-Arginine
 6. NBD-OH
 7. NBD-Aspartic acid
 8. NBD-Glycine
 9. NBD-Glutamic acid
 10. NBD-Threonine
 11. NBD-Alanine
 12. NBD-GABA
 13. NBD-Proline
 14. NBD-Methionine
 15. NBD-Valine
 16. NBD-Cysteine
 17. NBD-Ornithine
 18. NBD-Isoleucine
 19. NBD-Leucine
 20. NBD-Lysine
 21. NBD-Phenylalanine
 22. NBD-Tyrosine
 (50 μ mol/L each)

Data Source : LC InertSearch No. LB470

PFOS · PFOA

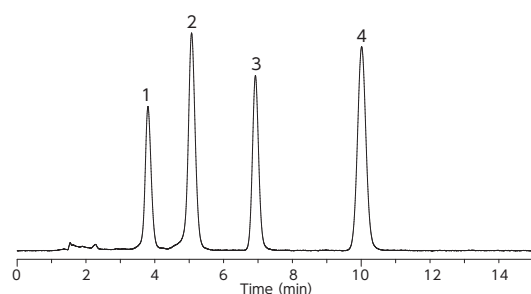


Conditions

Column : Inertsil ODS-4 (3 μ m, 100 $\times$ 2.1 mm I.D.)
 Eluent : A) 5 mM CH₃COONH₄ in CH₃OH
 B) 5 mM CH₃COONH₄ in H₂O
 A/B = 60/40 - 8 min - 75/25 - 0.1 min
 - 90/10 - 1.9 min - 90/10 - 0.1 min
 - 60/40 - 4.9 min - 90/10, v/v
 Flow Rate : 0.6 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
 Injection Vol.: 2 μ L
 Data Source : LC InertSearch No. LA864

Sample :
 1. PFOA (Perfluorooctanoic acid)
 2. PFOS (Perfluorooctanesulfonic acid)
 (1 mg/L each)

Analysis of Pre-column Derivatized Aflatoxin

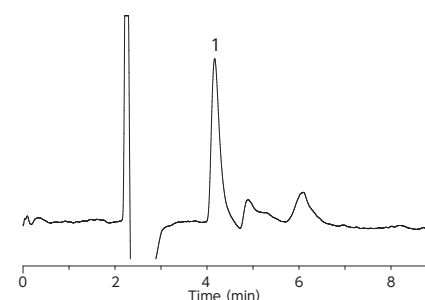


Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH B) CH₃CN C) H₂O
 A/B/C = 30/10/60, v/v/v (Premix)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 365 nm Em 450 nm
 Injection Vol.: 20 μ L
 Data Source : LC InertSearch No. LB107

Sample :
 1. Aflatoxin G1
 2. Aflatoxin B1
 3. Aflatoxin G2
 4. Aflatoxin B2
 (5 ng/mL each)

Hydrogen Peroxide



Conditions

Column : Inertsil CX (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Flow Rate : 0.8 mL/min
 Detection : ECD
 Injection Vol.: 100 μ L
 Data Source : LC Technical Note No. 49

Sample :
 1. Hydrogen peroxide (H₂O₂)
 (10 μ g/L)

Cat.No. INDEX

5020

-01005	112	-01768	15	-02741	19	-03367	123	-03579	123
-01006	112	-01770	15	-02742	19	-03368	123	-03580	123
-01007	112	-01771	15	-02743	19	-03369	123	-03581	124
-01008	112	-01772	15	-02744	19	-03370	124	-03582	124
-01009	112	-01774	15	-02745	19	-03371	124	-03585	121
-01013	135	-01775	15	-02746	19	-03372	124	-03586	122
-01014	135	-01776	15	-02752	132	-03373	124	-03587	123
-01021	84	-01790	15	-02754	132	-03374	124	-03588	122
-01022	84	-01791	15	-02755	132	-03375	124	-03589	124
-01023	84	-01801	17	-02756	132	-03376	124	-03593	122
-01024	84	-01802	17	-02757	136	-03377	124	-03594	122
-01025	84	-01811	17	-02762	132	-03378	123	-03595	121
-01026	84	-01812	17	-02764	132	-03379	123	-03596	121
-01027	84	-01821	17	-02765	132	-03380	123	-03597	123
-01028	84	-01822	17	-02766	132	-03381	124	-03598	123
-01103	132	-01880	151	-02767	136	-03382	124	-03651	125
-01104	132	-01881	151	-02811	19	-03385	121	-03652	125
-01120	110	-01900	35	-02812	19	-03386	122	-03653	125
-01121	26	-01901	35	-02813	19	-03387	123	-03654	125
-01122	26	-01902	35	-02814	19	-03388	122	-03655	125
-01123	26	-01903	35	-02815	19	-03389	124	-03656	125
-01124	26	-01910	35	-02816	19	-03393	122	-03657	125
-01125	26	-01911	35	-02821	19	-03394	122	-03658	125
-01126	26	-01912	35	-02822	19	-03395	121	-03659	125
-01127	26	-01913	35	-02823	19	-03396	121	-03660	125
-01128	26	-01920	45	-02824	19	-03397	123	-03664	125
-01203	133	-01921	45	-02825	19	-03398	123	-03665	125
-01204	133	-01922	45	-02826	19	-03399	110	-03666	125
-01221	36	-01923	45	-02831	19	-03451	121	-03667	125
-01222	36	-01930	45	-02832	19	-03452	121	-03668	125
-01223	36	-01931	45	-02833	19	-03453	121	-03669	125
-01224	36	-01932	45	-02834	19	-03455	121	-03670	125
-01225	36	-01933	45	-02835	19	-03456	121	-03671	125
-01226	36	-01940	83	-02836	19	-03457	121	-03672	125
-01227	36	-01941	83	-02841	19	-03458	122	-03673	125
-01228	36	-01942	83	-02842	19	-03459	122	-03674	125
-01321	47	-01943	83	-02843	19	-03460	122	-03675	125
-01322	47	-02001	21	-02844	19	-03464	122	-03676	125
-01323	47	-02002	21	-02845	19	-03465	122	-03677	125
-01324	47	-02611	23	-02846	19	-03466	123	-03678	125
-01325	47	-02612	23	-03251	121	-03467	123	-03679	125
-01326	47	-02613	23	-03252	121	-03468	123	-03680	125
-01327	47	-02614	23	-03253	121	-03469	123	-03681	125
-01328	47	-02615	23	-03255	121	-03470	124	-03682	125
-01421	37	-02616	23	-03256	121	-03471	124	-03685	125
-01422	37	-02621	23	-03257	121	-03472	124	-03686	125
-01423	37	-02622	23	-03258	122	-03473	124	-03687	125
-01424	37	-02623	23	-03259	122	-03474	124	-03688	125
-01425	37	-02624	23	-03260	122	-03475	124	-03689	125
-01426	37	-02625	23	-03264	122	-03476	124	-03690	125
-01427	37	-02626	23	-03265	122	-03477	124	-03693	125
-01428	37	-02631	23	-03266	123	-03478	123	-03694	125
-01603	132	-02632	23	-03267	123	-03479	123	-03695	125
-01604	132	-02633	23	-03268	123	-03480	123	-03696	125
-01621	24	-02634	23	-03269	123	-03481	124	-03697	125
-01622	24	-02635	23	-03270	124	-03482	124	-03698	125
-01623	24	-02636	23	-03271	124	-03485	121	-03911	13
-01624	24	-02641	23	-03272	124	-03486	122	-03912	13
-01625	24	-02642	23	-03273	124	-03487	123	-03913	13
-01626	24	-02643	23	-03274	124	-03488	122	-03914	13
-01627	24	-02644	23	-03275	124	-03489	124	-03915	13
-01628	24	-02645	23	-03276	124	-03493	122	-03916	13
-01631	15	-02646	23	-03277	124	-03494	122	-03917	13
-01632	15	-02652	132	-03278	123	-03495	121	-03921	13
-01633	15	-02654	132	-03279	123	-03496	121	-03922	13
-01641	35	-02655	132	-03280	123	-03497	123	-03923	13
-01642	35	-02656	132	-03281	124	-03498	123	-03924	13
-01700	75	-02657	136	-03282	124	-03551	121	-03925	13
-01701	75	-02662	132	-03285	121	-03552	121	-03926	13
-01702	75	-02664	132	-03286	122	-03553	121	-03927	13
-01703	75	-02665	132	-03287	123	-03555	121	-03931	13
-01711	75	-02666	132	-03288	122	-03556	121	-03932	13
-01712	75	-02667	136	-03289	124	-03557	121	-03933	13
-01713	135	-02711	19	-03293	122	-03558	122	-03934	13
-01714	135	-02712	19	-03294	122	-03559	122	-03935	13
-01731	15	-02713	19	-03295	121	-03560	122	-03936	13
-01732	15	-02714	19	-03296	121	-03564	122	-03937	13
-01733	131	-02715	19	-03297	123	-03565	122	-03941	13
-01734	131	-02716	19	-03298	123	-03566	123	-03942	13
-01741	15	-02721	19	-03351	121	-03567	123	-03943	13
-01742	15	-02722	19	-03352	121	-03568	123	-03944	13
-01751	15	-02723	19	-03353	121	-03569	123	-03945	13
-01752	15	-02724	19	-03355	121	-03570	124	-03946	13
-01761	15	-02725	19	-03356	121	-03571	124	-03947	13
-01762	15	-02726	19	-03357	121	-03572	124	-03953	131
-01763	15	-02731	19	-03358	122	-03573	124	-03954	131
-01764	15	-02732	19	-03359	122	-03574	124	-03955	131
-01765	15	-02733	19	-03360	122	-03575	124	-03956	131
-01766	15	-02734	19	-03364	122	-03576	124	-03957	136
-01767	15	-02735	19	-03365	122	-03577	124	-03963	131
		-02736	19	-03366	123	-03578	123	-03964	131

5020

-03965	131	-04089	132	-04279	123	-04481	124	-04725	21
-03966	131	-04090	132	-04280	123	-04482	124	-04726	21
-03967	136	-04091	137	-04281	124	-04485	121	-04731	21
-03971	33	-04092	132	-04282	124	-04486	122	-04732	21
-03972	33	-04093	132	-04285	121	-04487	123	-04733	21
-03973	33	-04094	132	-04286	122	-04488	122	-04734	21
-03974	33	-04095	132	-04287	123	-04489	124	-04735	21
-03975	33	-04096	137	-04288	122	-04493	122	-04736	21
-03976	33	-04151	121	-04289	124	-04494	122	-04741	21
-03977	33	-04152	121	-04293	122	-04495	121	-04742	21
-03978	33	-04153	121	-04294	122	-04496	121	-04743	21
-03979	33	-04155	121	-04295	121	-04497	123	-04744	21
-03980	33	-04156	121	-04296	121	-04498	123	-04752	132
-03981	33	-04157	121	-04297	123	-04511	15	-04754	132
-03982	33	-04158	122	-04298	123	-04512	15	-04755	132
-03983	33	-04159	122	-04311	75	-04513	15	-04756	132
-03984	33	-04160	122	-04312	75	-04514	15	-04757	136
-03985	33	-04161	122	-04313	75	-04515	15	-04762	132
-03986	33	-04162	123	-04314	75	-04521	15	-04764	132
-03987	33	-04163	123	-04315	75	-04522	15	-04765	132
-03988	33	-04164	123	-04316	75	-04523	15	-04766	132
-03989	33	-04165	122	-04321	75	-04524	15	-04767	136
-03990	33	-04166	123	-04322	75	-04525	15	-04811	35
-03991	33	-04167	123	-04323	75	-04531	15	-04812	35
-03992	33	-04168	123	-04324	75	-04532	15	-04813	35
-03993	33	-04169	123	-04325	75	-04533	15	-04814	35
-03994	33	-04170	124	-04326	75	-04541	15	-04815	35
-03995	33	-04171	124	-04331	75	-04554	131	-04816	35
-03996	33	-04172	124	-04332	75	-04557	136	-04817	35
-03997	33	-04173	124	-04333	75	-04611	15	-04821	35
-03998	33	-04174	124	-04334	75	-04612	15	-04822	35
-04001	13	-04175	124	-04335	75	-04613	15	-04823	35
-04012	13	-04176	124	-04336	75	-04614	15	-04824	35
-04013	13	-04177	124	-04341	75	-04615	15	-04825	35
-04014	13	-04178	123	-04342	75	-04616	15	-04826	35
-04015	13	-04179	123	-04343	75	-04617	15	-04827	35
-04016	13	-04180	123	-04344	75	-04621	15	-04831	35
-04017	13	-04181	124	-04352	135	-04622	15	-04832	35
-04021	13	-04182	124	-04353	135	-04623	15	-04833	35
-04022	13	-04183	122	-04354	135	-04624	15	-04835	35
-04023	13	-04184	122	-04355	138	-04625	15	-04836	35
-04024	13	-04185	121	-04362	135	-04626	15	-04837	35
-04025	13	-04186	122	-04364	135	-04627	15	-04841	35
-04026	13	-04187	123	-04365	135	-04631	15	-04842	35
-04027	13	-04188	122	-04366	135	-04632	15	-04844	35
-04031	13	-04189	124	-04367	138	-04633	15	-04845	35
-04032	13	-04193	122	-04411	15	-04634	15	-04851	121
-04033	13	-04194	122	-04412	15	-04635	15	-04852	121
-04034	13	-04195	121	-04413	15	-04636	15	-04853	121
-04035	13	-04196	121	-04414	15	-04637	15	-04855	121
-04036	13	-04197	123	-04415	15	-04641	15	-04856	121
-04037	13	-04198	123	-04416	15	-04642	15	-04857	121
-04042	13	-04211	75	-04417	15	-04643	15	-04858	122
-04043	13	-04212	75	-04421	15	-04644	15	-04859	122
-04044	13	-04213	75	-04422	15	-04645	15	-04860	122
-04045	13	-04214	75	-04423	15	-04646	15	-04864	122
-04046	13	-04215	75	-04424	15	-04647	15	-04865	122
-04047	13	-04216	75	-04425	15	-04661	21	-04866	123
-04051	33	-04217	75	-04426	15	-04662	21	-04867	123
-04052	33	-04218	75	-04427	15	-04663	21	-04868	123
-04053	33	-04219	75	-04431	15	-04664	21	-04869	123
-04054	33	-04220	75	-04432	15	-04665	21	-04870	124
-04055	33	-04221	75	-04433	15	-04666	21	-04871	124
-04056	33	-04222	75	-04434	15	-04671	21	-04872	124
-04057	33	-04223	75	-04435	15	-04672	21	-04873	124
-04061	33	-04224	75	-04436	15	-04673	21	-04874	124
-04062	33	-04225	75	-04441	15	-04674	21	-04875	124
-04063	33	-04226	75	-04442	15	-04675	21	-04876	124
-04064	33	-04227	75	-04443	15	-04676	21	-04877	124
-04065	33	-04228	75	-04444	15	-04677	21	-04878	123
-04066	33	-04229	75	-04445	15	-04678	21	-04879	123
-04067	33	-04230	75	-04446	15	-04679	21	-04880	123
-04071	33	-04231	75	-04447	15	-04680	21	-04881	124
-04072	33	-04232	75	-04448	15	-04681	21	-04882	124
-04073	33	-04233	75	-04449	15	-04682	21	-04883	121
-04074	33	-04234	75	-04450	15	-04683	21	-04884	121
-04075	33	-04235	75	-04451	15	-04684	21	-04885	121
-04076	33	-04236	75	-04452	15	-04685	21	-04886	122
-04077	33	-04237	75	-04453	15	-04686	21	-04887	123
-04080	33	-04238	75	-04454	15	-04687	21	-04888	122
-04081	33	-04239	75	-04455	15	-04688	21	-04889	124
-04082	33	-04240	75	-04456	15	-04689	21	-04893	122
-04083	33	-04241	75	-04457	15	-04690	21	-04894	122
-04084	33	-04242	75	-04458	15	-04691	21	-04895	121
-04085	33	-04243	75	-04459	15	-04692	21	-04896	121
-04086	33	-04244	75	-04460	15	-04693	21	-04897	123
-04087	132	-04245	75	-04461	15	-04694	21	-04898	123
-04088	132	-04246	75	-04462	15	-04695	21	-04911	35
		-04247	75	-04463	15	-04696	21	-04912	35
		-04248	75	-04464	15	-04697	21	-04913	35
		-04249	75	-04465	15	-04698	21	-04914	35
		-04250	75	-04466	15	-04699	21	-04915	35
		-04251	75	-04467	15	-04700	21	-04916	35
		-04252	75	-04468	15	-04701	21		
		-04253	75	-04469	15	-04702	21		
		-04254	75	-04470	15	-04703	21		
		-04255	75	-04471	15	-04704	21		
		-04256	75	-04472	15	-04705	21		
		-04257	75	-04473	15	-04706	21		
		-04258	75	-04474	15	-04707	21		
		-04259	75	-04475	15	-04708	21		
		-04260	75	-04476	15	-04709	21		
		-04261	75	-04477	15	-04710	21		
		-04262	75	-04478	15	-04711	21		
		-04263	75	-04479	15	-04712	21		
		-04264	75	-04480	15	-04713	21		
		-04265	75			-04714	21		
		-04266	75			-04715	21		
		-04267	75			-04716	21		
		-04268	75			-04717	21		
		-04269	75			-04718	21		
		-04270	75			-04719	21		
		-04271	75			-04720	21		
		-04272	75			-04721	21		
		-04273	75			-04722	21		
		-04274	75			-04723	21		
		-04275	75			-04724	21		
		-04276	75						
		-04277	75						
		-04278	75						

Cat.No. INDEX

5020

-04917	35	-05276	83	-05511	67	-05746	52	-05968	134
-04921	35	-05281	83	-05512	67	-05811	51	-05969	137
-04922	35	-05282	83	-05513	67	-05812	51	-05970	134
-04923	35	-05283	83	-05514	67	-05813	51	-05971	134
-04924	35	-05284	83	-05515	67	-05814	51	-05972	134
-04925	35	-05285	83	-05516	67	-05815	51	-05973	134
-04926	35	-05286	83	-05521	67	-05816	51	-05974	137
-04927	35	-05291	83	-05522	67	-05821	51	-05975	134
-04931	35	-05292	83	-05523	67	-05822	51	-05976	134
-04932	35	-05293	83	-05524	67	-05823	51	-05977	134
-04933	35	-05294	83	-05525	67	-05824	51	-05978	134
-04934	35	-05295	83	-05526	67	-05825	51	-05979	137
-04935	35	-05296	83	-05531	67	-05826	51	-05980	91/135
-04941	35	-05311	83	-05532	67	-05831	51	-05981	91/135
-04942	35	-05312	83	-05533	67	-05832	51	-05982	91/135
-04943	35	-05313	83	-05534	67	-05833	51	-05983	91/135
-04944	35	-05314	83	-05535	67	-05834	51	-05984	138
-04945	35	-05315	83	-05536	67	-05835	51	-05985	91/135
-04952	133	-05316	83	-05541	67	-05836	51	-05986	91/135
-04954	133	-05321	83	-05542	67	-05841	51	-05987	91/135
-04955	133	-05322	83	-05543	67	-05842	51	-05988	91/135
-04956	133	-05323	83	-05544	67	-05843	51	-05989	138
-04957	137	-05324	83	-05545	67	-05844	51	-05990	135
-04962	133	-05325	83	-05546	67	-05845	51	-05991	135
-04964	133	-05326	83	-05552	135	-05846	51	-05992	135
-04965	133	-05331	83	-05554	135	-05861	53	-05993	135
-04966	133	-05332	83	-05555	135	-05862	53	-05994	138
-04967	137	-05333	83	-05556	135	-05863	53	-05995	135
-05011	45	-05334	83	-05557	138	-05864	53	-05996	135
-05012	45	-05341	83	-05562	135	-05865	53	-05997	135
-05013	45	-05342	83	-05564	135	-05866	53	-05998	135
-05014	45	-05343	83	-05565	135	-05871	53	-05999	138
-05015	45	-05344	83	-05566	135	-05872	53	-06011	85
-05016	45	-05352	133	-05567	138	-05873	53	-06012	85
-05021	45	-05354	133	-05611	73	-05874	53	-06013	85
-05022	45	-05355	133	-05612	73	-05875	53	-06014	85
-05023	45	-05356	133	-05613	73	-05876	53	-06015	85
-05024	45	-05357	137	-05614	73	-05881	53	-06016	85
-05025	45	-05362	133	-05615	73	-05882	53	-06021	85
-05026	45	-05364	133	-05616	73	-05883	53	-06022	85
-05031	45	-05365	133	-05621	73	-05884	53	-06023	85
-05032	45	-05366	133	-05622	73	-05885	53	-06024	85
-05033	45	-05367	137	-05623	73	-05886	53	-06025	85
-05035	45	-05411	73	-05624	73	-05891	53	-06026	85
-05036	45	-05412	73	-05625	73	-05892	53	-06031	85
-05041	45	-05413	73	-05626	73	-05893	53	-06032	85
-05042	45	-05414	73	-05631	73	-05894	53	-06033	85
-05044	45	-05415	73	-05632	73	-05895	53	-06034	85
-05111	45	-05416	73	-05633	73	-05896	53	-06035	85
-05112	45	-05421	73	-05634	73	-05911	91	-06036	85
-05113	45	-05422	73	-05635	73	-05912	91	-06041	85
-05114	45	-05423	73	-05636	73	-05913	91	-06042	85
-05115	45	-05424	73	-05641	73	-05914	91	-06043	85
-05116	45	-05425	73	-05642	73	-05915	91	-06044	85
-05121	45	-05426	73	-05643	73	-05916	91	-06045	85
-05122	45	-05431	73	-05644	73	-05921	91	-06046	85
-05123	45	-05432	73	-05645	73	-05922	91	-06131	138
-05124	45	-05433	73	-05646	73	-05923	91	-06132	136
-05125	45	-05434	73	-05652	135	-05924	91	-06133	137
-05126	45	-05435	73	-05654	135	-05925	91	-06136	136
-05131	45	-05436	73	-05655	135	-05926	91	-06141	135
-05132	45	-05441	73	-05656	135	-05931	91	-06142	132
-05133	45	-05442	73	-05657	138	-05932	91	-06143	133
-05134	45	-05443	73	-05662	135	-05933	91	-06146	132
-05141	45	-05444	73	-05664	135	-05934	91	-06801	136
-05142	45	-05445	73	-05665	135	-05935	91	-06802	131
-05143	45	-05446	73	-05666	135	-05936	91	-06803	131
-05144	45	-05461	67	-05667	138	-05941	91	-06804	131
-05152	133	-05462	67	-05711	52	-05942	91	-06811	136
-05154	133	-05463	67	-05712	52	-05943	91	-06812	131
-05155	133	-05464	67	-05713	52	-05944	91	-06813	131
-05156	133	-05465	67	-05714	52	-05945	91	-06814	131
-05157	137	-05466	67	-05715	52	-05946	91	-06821	136
-05162	133	-05471	67	-05716	52	-05950	134	-06822	131
-05164	133	-05472	67	-05721	52	-05951	134	-06823	131
-05165	133	-05473	67	-05722	52	-05952	134	-06824	131
-05166	133	-05474	67	-05723	52	-05953	134	-06831	136
-05167	137	-05475	67	-05724	52	-05954	137	-06832	131
-05261	83	-05476	67	-05725	52	-05955	134	-06833	131
-05262	83	-05481	67	-05726	52	-05956	134	-06834	131
-05263	83	-05482	67	-05731	52	-05957	134	-06851	136
-05264	83	-05483	67	-05732	52	-05958	134	-06852	131
-05265	83	-05484	67	-05733	52	-05959	137	-06920	139
-05266	83	-05485	67	-05734	52	-05960	134	-07011	131
-05271	83	-05486	67	-05735	52	-05961	134	-07012	131
-05272	83	-05491	67	-05736	52	-05962	134	-07013	131
-05273	83	-05492	67	-05741	52	-05963	134	-07014	131
-05274	83	-05493	67	-05742	52	-05964	137	-07015	131
-05275	83	-05494	67	-05743	52	-05965	134	-07111	97
		-05495	67	-05744	52	-05966	134	-07112	97
		-05496	67	-05745	52	-05967	134	-07113	97

5020

-07114.....	97	-07417.....	5	-07792.....	63	-08071.....	138	-10123.....	153
-07115.....	97	-07421.....	5	-07793.....	63	-08072.....	138	-10141.....	154
-07116.....	97	-07422.....	5	-07794.....	63	-08073.....	138	-10143.....	154
-07121.....	97	-07423.....	5	-07795.....	63	-08074.....	138	-10151.....	154
-07122.....	97	-07424.....	5	-07796.....	63	-08075.....	138	-10153.....	154
-07123.....	97	-07425.....	5	-07801.....	61	-08076.....	138	-10161.....	154
-07124.....	97	-07426.....	5	-07802.....	61	-08081.....	135	-10163.....	154
-07125.....	97	-07427.....	5	-07803.....	61	-08082.....	135	-10171.....	155
-07126.....	97	-07431.....	5	-07804.....	61	-08083.....	135	-10172.....	155
-07131.....	97	-07432.....	5	-07805.....	61	-08084.....	135	-10173.....	155
-07132.....	97	-07433.....	5	-07806.....	61	-08085.....	135	-10174.....	155
-07133.....	97	-07434.....	5	-07811.....	61	-08086.....	135	-10175.....	155
-07134.....	97	-07435.....	5	-07812.....	61	-08087.....	135	-10176.....	155
-07135.....	97	-07436.....	5	-07813.....	61	-08088.....	135	-10177.....	155
-07136.....	97	-07437.....	5	-07814.....	61	-08089.....	135	-10181.....	155
-07141.....	97	-07441.....	5	-07815.....	61	-08500.....	5/7/9/11/15/ 17/19/21/22/23/25/27/ 29/30/31/33/35/37/39/ 41/43/44/45/49/51/53/59/ /61/63/65/67/73/75/79/8 1/84/85/89/91/95/97	-10182.....	155
-07142.....	97	-07442.....	5	-07816.....	61			-10183.....	155
-07143.....	97	-07443.....	5	-07821.....	61			-10191.....	155
-07144.....	97	-07444.....	5	-07822.....	61			-10192.....	155
-07145.....	97	-07445.....	5	-07823.....	61			-10193.....	155
-07146.....	97	-07446.....	5	-07824.....	61			-10200.....	155
-07211.....	95	-07447.....	5	-07825.....	61	-08550.....	5/7/9/11/15/ 17/19/21/22/23/25/27/ 29/30/31/33/35/37/39/ 41/43/44/45/49/51/53/59/ /61/63/65/67/73/75/79/ 81/84/85/89/91/95/97	-10201.....	155
-07212.....	95	-07504.....	109	-07826.....	61			-10202.....	155
-07213.....	95	-07505.....	109	-07831.....	61			-10211.....	154
-07214.....	95	-07514.....	109	-07832.....	61			-10212.....	154
-07215.....	95	-07515.....	109	-07833.....	61			-10213.....	154
-07216.....	95	-07524.....	109	-07834.....	61			-10221.....	154
-07221.....	95	-07525.....	109	-07835.....	61	-08630.....	119	-10222.....	154
-07222.....	95	-07534.....	109	-07836.....	61	-08640.....	104	-10223.....	154
-07223.....	95	-07535.....	109	-07842.....	134	-08641.....	104	-10231.....	154
-07224.....	95	-07545.....	109	-07844.....	134	-08650.....	116	-10232.....	154
-07225.....	95	-07546.....	109	-07845.....	134	-10000.....	154	-10241.....	154
-07226.....	95	-07555.....	109	-07846.....	134	-10001.....	154	-10242.....	154
-07231.....	95	-07556.....	109	-07847.....	137	-10002.....	154	-10380.....	158
-07232.....	95	-07565.....	109	-07852.....	134	-10005.....	153	-10381.....	158
-07233.....	95	-07566.....	109	-07854.....	134	-10006.....	153	-10382.....	158
-07234.....	95	-07575.....	109	-07855.....	134	-10007.....	153	-10383.....	159
-07235.....	95	-07576.....	109	-07856.....	134	-10008.....	153	-10384.....	159
-07236.....	95	-07701.....	63	-07857.....	137	-10010.....	154	-10385.....	159
-07241.....	95	-07702.....	63	-07861.....	61	-10011.....	154	-10386.....	159
-07242.....	95	-07703.....	63	-07862.....	61	-10012.....	154	-10387.....	159
-07243.....	95	-07704.....	63	-07863.....	61	-10013.....	153	-10388.....	159
-07244.....	95	-07705.....	63	-07864.....	61	-10015.....	153	-10389.....	159
-07245.....	95	-07706.....	63	-07865.....	61	-10018.....	153	-10390.....	159
-07246.....	95	-07711.....	63	-07866.....	61	-10019.....	153	-10391.....	159
-07311.....	5	-07712.....	63	-07871.....	61	-10020.....	154	-10392.....	159
-07312.....	5	-07713.....	63	-07872.....	61	-10021.....	154	-10393.....	159
-07313.....	5	-07714.....	63	-07873.....	61	-10022.....	154	-10394.....	159
-07314.....	5	-07715.....	63	-07874.....	61	-10023.....	153	-10401.....	126
-07315.....	5	-07716.....	63	-07875.....	61	-10026.....	155	-10402.....	126
-07316.....	5	-07721.....	63	-07876.....	61	-10027.....	155	-10403.....	126
-07317.....	5	-07722.....	63	-07881.....	61	-10028.....	155	-10404.....	126
-07321.....	5	-07723.....	63	-07882.....	61	-10029.....	155	-10405.....	126
-07322.....	5	-07724.....	63	-07883.....	61	-10031.....	155	-10901.....	16
-07323.....	5	-07725.....	63	-07884.....	61	-10033.....	155	-10902.....	16
-07324.....	5	-07726.....	63	-07885.....	61	-10034.....	155	-10911.....	16
-07325.....	5	-07731.....	63	-07886.....	61	-10036.....	155	-10912.....	16
-07326.....	5	-07732.....	63	-07891.....	61	-10037.....	155	-10921.....	16
-07327.....	5	-07733.....	63	-07892.....	61	-10038.....	155	-10922.....	16
-07331.....	5	-07734.....	63	-07893.....	61	-10039.....	155	-10999.....	107
-07332.....	5	-07735.....	63	-07894.....	61	-10041.....	154	-11000.....	107
-07333.....	5	-07736.....	63	-07895.....	61	-10043.....	154	-11001.....	106
-07334.....	5	-07742.....	134	-07896.....	61	-10051.....	154	-11002.....	104
-07335.....	5	-07744.....	134	-08002.....	108	-10053.....	154	-11003.....	103
-07336.....	5	-07745.....	134	-08004.....	108	-10061.....	154	-11006.....	105
-07337.....	5	-07746.....	134	-08005.....	108	-10063.....	154	-11007.....	105
-07341.....	5	-07747.....	137	-08006.....	108	-10066.....	153	-11501.....	144
-07342.....	5	-07752.....	134	-08012.....	108	-10067.....	153	-11502.....	144
-07343.....	5	-07754.....	134	-08014.....	108	-10071.....	155	-11503.....	145
-07344.....	5	-07755.....	134	-08015.....	108	-10072.....	155	-11504.....	145
-07345.....	5	-07756.....	134	-08016.....	108	-10073.....	155	-11505.....	145
-07346.....	5	-07757.....	137	-08022.....	108	-10074.....	155	-11506.....	144
-07348.....	5	-07761.....	63	-08024.....	108	-10075.....	155	-11507.....	144
-07352.....	131	-07762.....	63	-08025.....	108	-10076.....	155	-11508.....	144
-07353.....	131	-07763.....	63	-08026.....	108	-10077.....	155	-11509.....	144
-07354.....	131	-07764.....	63	-08032.....	108	-10081.....	155	-11514.....	146
-07355.....	131	-07765.....	63	-08034.....	108	-10082.....	155	-11515.....	146
-07356.....	131	-07766.....	63	-08035.....	108	-10083.....	155	-11516.....	147
-07357.....	136	-07771.....	63	-08036.....	108	-10091.....	155	-11517.....	147
-07362.....	131	-07772.....	63	-08042.....	108	-10092.....	155	-11518.....	149
-07363.....	131	-07773.....	63	-08044.....	108	-10093.....	155	-11519.....	149
-07365.....	131	-07774.....	63	-08045.....	108	-10100.....	154	-11520.....	148
-07366.....	131	-07775.....	63	-08046.....	108	-10101.....	154	-11521.....	148
-07367.....	136	-07776.....	63	-08052.....	108	-10102.....	154	-11522.....	149
-07411.....	5	-07781.....	63	-08054.....	108	-10110.....	154	-11523.....	149
-07412.....	5	-07782.....	63	-08055.....	108	-10111.....	154	-11524.....	148
-07413.....	5	-07783.....	63	-08056.....	108	-10112.....	154	-11525.....	148
-07414.....	5	-07784.....	63	-08062.....	135	-10113.....	153	-11526.....	149
-07415.....	5	-07785.....	63	-08064.....	135	-10120.....	154	-11527.....	149
-07416.....	5	-07786.....	63	-08065.....	135	-10121.....	154	-11528.....	146
		-07791.....	63	-08066.....	135	-10122.....	154	-11529.....	147

Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
------------------------	---------------	----------------------	-------------	----------------------	------------------------------	---------------	---------------------	-------------------	--------------	----------------

Cat.No. INDEX

5020

-11533	149	-11670	148	-11809	150	-14045	45	-14274	131
-11534	149	-11671	148	-11814	150	-14046	45	-14275	131
-11535	146	-11672	149	-11815	150	-14047	45	-14276	131
-11536	146	-11673	149	-11816	150	-14048	45	-14277	136
-11538	143	-11674	148	-11817	150	-14049	45	-14301	5
-11539	143	-11675	148	-11818	150	-14051	33	-14302	5
-11540	148	-11676	149	-11819	150	-14052	33	-14303	5
-11541	148	-11677	149	-11820	150	-14053	33	-14304	5
-11551	144	-11678	146	-11821	150	-14054	33	-14305	5
-11552	144	-11679	147	-11822	150	-14055	33	-14306	5
-11553	145	-11683	149	-11823	150	-14056	33	-14311	5
-11554	145	-11684	149	-11824	150	-14057	33	-14312	5
-11555	145	-11685	146	-11825	150	-14058	33	-14313	5
-11556	144	-11686	146	-11826	150	-14059	33	-14314	5
-11557	144	-11688	143	-11827	150	-14061	13	-14315	5
-11558	144	-11689	143	-11828	150	-14062	13	-14316	5
-11559	144	-11690	148	-11829	150	-14063	13	-14351	5
-11564	146	-11691	148	-11833	150	-14064	13	-14352	5
-11565	146	-11701	144	-11834	150	-14065	13	-14353	5
-11566	147	-11702	144	-11835	150	-14066	13	-14354	5
-11567	147	-11703	145	-11836	150	-14067	13	-14355	5
-11568	149	-11704	145	-11846	150	-14068	13	-14361	5
-11569	149	-11705	145	-11847	150	-14069	13	-14362	5
-11570	148	-11706	145	-11848	150	-14071	33	-14363	5
-11571	148	-11707	145	-11849	150	-14072	33	-14364	5
-11572	149	-11708	145	-12750	127	-14073	33	-14365	5
-11573	149	-11709	145	-12755	127	-14074	33	-14411	5
-11574	148	-11714	146	-12760	127	-14075	33	-14412	5
-11575	148	-11715	146	-12770	127	-14076	33	-14413	5
-11576	149	-11716	147	-12780	127	-14077	33	-14414	5
-11577	149	-11717	147	-12790	127	-14078	33	-14415	5
-11578	146	-11718	149	-13241	15	-14079	33	-14416	5
-11579	147	-11719	149	-13242	15	-14081	14	-14421	5
-11583	149	-11720	148	-13251	15	-14082	14	-14422	5
-11584	149	-11721	148	-13252	15	-14083	14	-14423	5
-11585	146	-11722	149	-13350	15	-14084	14	-14424	5
-11586	146	-11723	149	-13360	15	-14085	14	-14425	5
-11588	143	-11724	148	-13410	75	-14086	14	-14426	5
-11589	143	-11725	148	-13412	75	-14087	14	-14441	5
-11590	148	-11726	149	-13420	75	-14088	14	-14442	5
-11591	148	-11727	149	-13422	75	-14089	14	-14443	5
-11601	144	-11728	146	-13510	35	-14091	19	-14444	5
-11602	144	-11729	147	-13512	35	-14092	19	-14445	5
-11603	145	-11733	149	-13520	35	-14093	19	-14446	5
-11604	145	-11734	149	-13522	35	-14094	19	-15001	144
-11605	145	-11735	146	-13610	45	-14095	19	-15002	144
-11606	145	-11736	146	-13612	45	-14096	19	-15003	145
-11607	145	-11738	143	-13620	45	-14097	19	-15004	145
-11608	145	-11739	143	-13622	45	-14098	19	-15005	145
-11609	145	-11740	148	-13710	83	-14099	19	-15006	145
-11614	146	-11741	148	-13712	83	-14101	35	-15007	145
-11615	146	-11751	144	-14001	13	-14102	35	-15008	145
-11616	147	-11752	144	-14002	13	-14103	35	-15009	145
-11617	147	-11753	145	-14003	13	-14104	35	-15014	146
-11618	149	-11754	145	-14004	13	-14105	35	-15015	146
-11619	149	-11755	145	-14005	13	-14106	35	-15016	147
-11620	148	-11756	145	-14006	13	-14107	35	-15017	147
-11621	148	-11757	145	-14007	13	-14108	35	-15018	149
-11622	149	-11758	145	-14008	13	-14109	35	-15019	149
-11623	149	-11759	145	-14009	13	-14111	45	-15020	148
-11624	148	-11764	146	-14011	14	-14112	45	-15021	148
-11625	148	-11765	146	-14012	14	-14113	45	-15022	149
-11626	149	-11766	147	-14013	14	-14114	45	-15023	149
-11627	149	-11767	147	-14014	14	-14115	45	-15024	148
-11628	149	-11768	149	-14015	14	-14116	45	-15025	148
-11629	147	-11769	149	-14016	14	-14117	45	-15026	149
-11633	149	-11770	148	-14017	14	-14118	45	-15027	149
-11634	149	-11771	148	-14018	14	-14119	45	-15028	146
-11635	146	-11772	149	-14019	14	-14201	5	-15029	147
-11636	146	-11773	149	-14021	19	-14202	5	-15033	149
-11638	143	-11774	148	-14022	19	-14203	5	-15034	149
-11639	143	-11775	148	-14023	19	-14204	5	-15035	146
-11640	148	-11776	149	-14024	19	-14205	5	-15036	146
-11641	148	-11777	149	-14025	19	-14206	5	-15037	143
-11651	144	-11778	146	-14026	19	-14211	5	-15038	143
-11652	144	-11779	147	-14027	19	-14212	5	-15039	148
-11653	145	-11783	149	-14028	19	-14213	5	-15040	148
-11654	145	-11784	149	-14029	19	-14214	5	-15051	144
-11655	145	-11785	146	-14031	35	-14215	5	-15052	144
-11656	145	-11786	146	-14032	35	-14216	5	-15053	145
-11657	145	-11788	143	-14033	35	-14252	131	-15054	145
-11658	145	-11789	143	-14034	35	-14254	131	-15055	145
-11659	145	-11790	148	-14035	35	-14255	131	-15056	145
-11664	146	-11791	148	-14036	35	-14256	131	-15057	145
-11665	146	-11801	150	-14037	35	-14257	136	-15058	145
-11666	147	-11802	150	-14038	35	-14262	131	-15059	145
-11667	147	-11803	150	-14039	35	-14264	131	-15064	146
-11668	149	-11805	150	-14041	45	-14265	131	-15065	146
-11669	149	-11806	150	-14042	45	-14266	131	-15066	147
		-11807	150	-14043	45	-14267	136	-15067	147
		-11808	150	-14044	45	-14272	131	-15068	149

5020

-15069	149	-15205	145	-15337	143	-15476	149	-15642	132
-15070	148	-15206	145	-15338	143	-15477	149	-15643	133
-15071	148	-15207	145	-15339	148	-15478	146	-15646	132
-15072	149	-15208	145	-15340	148	-15479	147	-15701	139
-15073	149	-15209	145	-15351	145	-15483	149	-15702	139
-15074	148	-15214	146	-15352	145	-15484	149	-15703	139
-15075	148	-15215	146	-15353	145	-15485	146	-15706	139
-15076	149	-15216	147	-15354	145	-15486	146	-15708	139
-15077	149	-15217	147	-15355	145	-15487	143	-15710	139
-15078	146	-15218	149	-15356	145	-15488	143	-15711	139
-15079	147	-15219	149	-15357	145	-15489	148	-15714	139
-15083	149	-15220	148	-15358	145	-15490	148	-15716	139
-15084	149	-15221	148	-15359	145	-15501	145	-15718	139
-15085	146	-15222	149	-15364	146	-15502	145	-15720	139
-15086	146	-15223	149	-15365	146	-15503	145	-15722	139
-15087	143	-15224	148	-15366	147	-15504	145	-15724	139
-15088	143	-15225	148	-15367	147	-15505	145	-15726	139
-15089	148	-15226	149	-15368	149	-15506	145	-15728	139
-15090	148	-15227	149	-15369	149	-15507	145	-15729	139
-15101	144	-15228	146	-15370	148	-15508	145	-15730	139
-15102	144	-15229	147	-15371	148	-15509	145	-15731	139
-15103	145	-15233	149	-15372	149	-15514	146	-15732	139
-15104	145	-15234	149	-15373	149	-15515	146	-15735	139
-15105	145	-15235	146	-15374	148	-15516	147	-15736	139
-15106	145	-15236	146	-15375	148	-15517	147	-15737	139
-15107	145	-15237	143	-15376	149	-15518	149	-15738	139
-15108	145	-15238	143	-15377	149	-15519	149	-15739	139
-15109	145	-15239	148	-15378	146	-15520	148	-15740	139
-15110	145	-15240	148	-15379	147	-15521	148	-15741	139
-15111	146	-15251	144	-15383	149	-15522	149	-15744	139
-15112	146	-15252	144	-15384	149	-15523	149	-15745	139
-15113	146	-15253	145	-15385	146	-15524	148	-15751	139
-15114	147	-15254	145	-15386	146	-15525	148	-15752	139
-15115	147	-15255	145	-15387	143	-15526	149	-15753	139
-15116	149	-15256	145	-15388	143	-15527	149	-15756	139
-15117	149	-15257	145	-15389	148	-15528	146	-15758	139
-15118	149	-15258	145	-15390	148	-15529	147	-15760	139
-15119	149	-15259	145	-15401	145	-15533	149	-15761	139
-15120	148	-15264	146	-15402	145	-15534	149	-15764	139
-15121	148	-15265	146	-15403	145	-15535	146	-15766	139
-15122	149	-15266	147	-15404	145	-15536	146	-15768	139
-15123	149	-15267	147	-15405	145	-15537	143	-15770	139
-15124	148	-15268	149	-15406	145	-15538	143	-15772	139
-15125	148	-15269	149	-15407	145	-15539	148	-15774	139
-15126	149	-15270	148	-15408	145	-15540	148	-15776	139
-15127	149	-15271	148	-15409	145	-15551	145	-15778	139
-15128	146	-15272	149	-15414	146	-15552	145	-15779	139
-15129	147	-15273	149	-15415	146	-15553	145	-15780	139
-15130	149	-15274	148	-15416	147	-15554	145	-15781	139
-15131	146	-15275	148	-15417	147	-15555	145	-15782	139
-15132	143	-15276	149	-15418	149	-15556	145	-15785	139
-15133	143	-15277	149	-15419	149	-15557	145	-15786	139
-15134	143	-15278	146	-15420	148	-15558	145	-15787	139
-15135	148	-15279	147	-15421	148	-15559	145	-15788	139
-15136	148	-15283	149	-15422	149	-15564	146	-15789	139
-15137	144	-15284	149	-15423	149	-15565	146	-15790	139
-15138	144	-15285	146	-15424	148	-15566	147	-15791	139
-15139	145	-15286	146	-15425	148	-15567	147	-15794	139
-15140	145	-15287	143	-15426	149	-15568	149	-15795	139
-15141	145	-15288	143	-15427	149	-15569	149	-15801	121
-15142	145	-15289	148	-15428	146	-15570	148	-15802	121
-15143	145	-15290	148	-15429	147	-15571	148	-15803	121
-15144	145	-15301	145	-15433	149	-15572	149	-15805	121
-15145	146	-15302	145	-15434	149	-15573	149	-15806	121
-15146	146	-15303	145	-15435	146	-15574	148	-15807	121
-15147	147	-15304	145	-15436	146	-15575	148	-15808	122
-15148	147	-15305	145	-15437	143	-15576	149	-15809	122
-15149	149	-15306	145	-15438	143	-15577	149	-15810	122
-15150	149	-15307	145	-15439	148	-15578	146	-15814	122
-15151	148	-15308	145	-15440	148	-15579	147	-15815	122
-15152	148	-15309	145	-15451	145	-15583	149	-15816	123
-15153	149	-15314	146	-15452	145	-15584	149	-15817	123
-15154	149	-15315	146	-15453	145	-15585	146	-15818	123
-15155	148	-15316	147	-15454	145	-15586	146	-15819	123
-15156	148	-15317	147	-15455	145	-15587	143	-15820	124
-15157	149	-15318	149	-15456	145	-15588	143	-15821	124
-15158	149	-15319	149	-15457	145	-15589	148	-15822	124
-15159	146	-15320	148	-15458	145	-15590	148	-15823	124
-15160	147	-15321	148	-15459	145	-15601	138	-15824	124
-15161	149	-15322	149	-15464	146	-15602	136	-15825	124
-15162	149	-15323	149	-15465	146	-15603	137	-15826	124
-15163	146	-15324	148	-15466	147	-15606	136	-15827	124
-15164	146	-15325	148	-15467	147	-15611	135	-15828	123
-15165	143	-15326	149	-15468	149	-15612	132	-15829	123
-15166	143	-15327	149	-15469	149	-15613	133	-15830	123
-15167	148	-15328	146	-15470	148	-15616	132	-15831	124
-15168	148	-15329	147	-15471	148	-15631	138	-15832	124
-15169	144	-15333	149	-15472	149	-15632	136	-15835	121
-15170	144	-15334	149	-15473	149	-15633	137	-15836	122
-15171	145	-15335	146	-15474	148	-15636	136	-15837	123
-15172	145	-15336	146	-15475	148	-15641	135	-15838	122

Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
------------------------	---------------	----------------------	-------------	----------------------	------------------------------	---------------	---------------------	-------------------	--------------	----------------

Cat.No. INDEX

5020

-15839	124	-15956	121	-16062	132	-16169	29	-16319	43
-15843	122	-15957	121	-16063	132	-16170	29	-16320	43
-15844	122	-15958	122	-16064	132	-16171	29	-16321	43
-15845	121	-15959	122	-16065	132	-16172	29	-16323	43
-15846	121	-15960	122	-16066	132	-16173	29	-16324	43
-15847	123	-15964	122	-16067	132	-16174	29	-16325	43
-15848	123	-15965	122	-16068	132	-16175	29	-16326	43
-15851	121	-15966	123	-16069	132	-16176	29	-16327	43
-15852	121	-15967	123	-16070	132	-16177	29	-16328	43
-15853	121	-15968	123	-16071	132	-16178	29	-16330	123
-15855	121	-15969	123	-16072	132	-16179	29	-16331	123
-15856	121	-15970	124	-16073	132	-16180	122	-16332	123
-15857	121	-15971	124	-16074	132	-16181	122	-16333	123
-15858	122	-15972	124	-16075	136	-16182	122	-16334	125
-15859	122	-15973	124	-16076	136	-16183	122	-16335	123
-15860	122	-15974	124	-16077	136	-16184	145	-16336	123
-15864	122	-15975	124	-16078	136	-16185	145	-16337	123
-15865	122	-15976	124	-16079	136	-16186	145	-16338	123
-15866	123	-15977	124	-16080	139	-16187	145	-16339	43
-15867	123	-15978	123	-16081	139	-16188	145	-16340	43
-15868	123	-15979	123	-16082	145	-16189	145	-16341	43
-15869	123	-15980	123	-16083	145	-16190	150	-16342	43
-15870	124	-15981	124	-16084	145	-16191	145	-16343	43
-15871	124	-15982	124	-16085	145	-16192	145	-16344	43
-15872	124	-15985	121	-16086	145	-16193	145	-16345	43
-15873	124	-15986	122	-16087	145	-16194	145	-16346	43
-15874	124	-15987	123	-16088	150	-16195	145	-16347	43
-15875	124	-15988	122	-16090	145	-16196	145	-16348	43
-15876	124	-15989	124	-16091	145	-16197	145	-16349	43
-15877	124	-15993	122	-16092	145	-16198	145	-16350	43
-15878	123	-15994	122	-16093	145	-16199	145	-16351	123
-15879	123	-15995	121	-16094	145	-16200	145	-16352	123
-15880	123	-15996	121	-16095	145	-16201	145	-16353	123
-15881	124	-15997	123	-16096	145	-16202	145	-16354	123
-15882	124	-15998	123	-16097	145	-16203	29	-16355	133
-15885	121	-16002	29	-16098	145	-16204	29	-16356	133
-15886	122	-16003	29	-16099	145	-16205	29	-16357	133
-15887	123	-16004	29	-16100	145	-16206	29	-16358	133
-15888	122	-16005	29	-16101	145	-16207	29	-16359	133
-15889	124	-16006	29	-16102	29	-16208	29	-16360	133
-15893	122	-16007	29	-16103	29	-16209	29	-16361	133
-15894	122	-16009	29	-16104	29	-16210	29	-16362	133
-15895	121	-16010	29	-16105	29	-16211	29	-16363	133
-15896	121	-16011	29	-16106	29	-16212	29	-16364	133
-15897	123	-16012	29	-16107	29	-16213	29	-16365	133
-15898	123	-16013	29	-16108	29	-16214	29	-16366	133
-15901	121	-16014	29	-16109	29	-16215	120	-16367	133
-15902	121	-16016	29	-16110	29	-16216	120	-16368	133
-15903	121	-16017	29	-16111	29	-16217	29	-16369	133
-15905	121	-16018	29	-16112	29	-16218	29	-16370	133
-15906	121	-16019	29	-16113	29	-16219	29	-16371	133
-15907	121	-16020	29	-16116	116	-16220	29	-16372	133
-15908	122	-16021	29	-16117	116	-16221	29	-16373	133
-15909	122	-16023	29	-16118	116	-16222	29	-16374	133
-15910	122	-16024	29	-16119	116	-16223	29	-16375	137
-15914	122	-16025	29	-16122	120	-16224	29	-16376	137
-15915	122	-16026	29	-16123	120	-16225	29	-16377	137
-15916	123	-16027	29	-16132	29	-16226	29	-16378	137
-15917	123	-16028	29	-16133	29	-16227	29	-16379	137
-15918	123	-16030	122	-16134	29	-16228	29	-16380	139
-15919	123	-16031	122	-16135	29	-16229	29	-16381	139
-15920	124	-16032	122	-16136	29	-16230	29	-16382	147
-15921	124	-16033	122	-16137	29	-16231	29	-16383	147
-15922	124	-16034	125	-16139	29	-16232	29	-16384	147
-15923	124	-16035	122	-16140	29	-16233	29	-16385	147
-15924	124	-16036	122	-16141	29	-16234	29	-16386	147
-15925	124	-16037	122	-16142	29	-16235	29	-16387	147
-15926	124	-16038	122	-16143	29	-16236	29	-16388	150
-15927	124	-16039	29	-16144	29	-16237	29	-16390	147
-15928	123	-16040	29	-16146	29	-16238	29	-16391	147
-15929	123	-16041	29	-16147	29	-16239	29	-16392	147
-15930	123	-16042	29	-16148	29	-16240	29	-16393	147
-15931	124	-16043	29	-16149	29	-16241	29	-16394	147
-15932	124	-16044	29	-16150	29	-16242	29	-16395	147
-15933	121	-16045	29	-16151	29	-16243	29	-16396	147
-15936	122	-16046	29	-16153	29	-16244	29	-16397	147
-15937	123	-16047	29	-16154	29	-16302	43	-16398	147
-15938	122	-16048	29	-16155	29	-16303	43	-16399	147
-15939	124	-16049	29	-16156	29	-16304	43	-16400	147
-15943	122	-16050	29	-16157	29	-16305	43	-16401	147
-15944	122	-16051	122	-16158	29	-16306	43	-16402	43
-15945	121	-16052	122	-16159	122	-16307	43	-16403	43
-15946	121	-16053	122	-16160	122	-16309	43	-16404	43
-15947	123	-16054	122	-16161	122	-16310	43	-16405	43
-15948	123	-16055	132	-16162	122	-16311	43	-16406	43
-15951	121	-16056	132	-16163	125	-16312	43	-16407	43
-15952	121	-16057	132	-16164	122	-16313	43	-16408	43
-15953	121	-16058	132	-16165	122	-16314	43	-16409	43
-15955	121	-16059	132	-16166	122	-16316	43	-16410	43
		-16060	132	-16167	122	-16317	43	-16411	43
		-16061	132	-16168	29	-16318	43	-16412	43

5020

-16413	43	-16517	43	-16669	135	-16776	65	-19008	21
-16416	117	-16518	43	-16670	135	-16777	65	-19009	21
-16417	117	-16519	43	-16671	135	-16778	65	-19010	23
-16418	117	-16520	43	-16672	135	-16779	65	-19011	108
-16419	117	-16521	43	-16673	135	-16780	124	-19012	109
-16422	120	-16522	43	-16674	135	-16781	124	-19013	109
-16423	120	-16523	43	-16675	137	-16782	124	-19014	35
-16432	43	-16524	43	-16676	137	-16783	124	-19015	35
-16433	43	-16525	43	-16677	137	-16784	148	-19016	45
-16434	43	-16526	43	-16678	137	-16785	148	-19017	45
-16435	43	-16527	43	-16679	137	-16786	148	-19018	83
-16436	43	-16528	43	-16680	139	-16787	148	-19019	83
-16437	43	-16529	43	-16681	139	-16788	148	-19020	67
-16439	43	-16530	43	-16682	148	-16789	148	-19021	67
-16440	43	-16531	43	-16683	148	-16790	150	-19022	73
-16441	43	-16532	43	-16684	148	-16791	148	-19023	73
-16442	43	-16533	43	-16685	148	-16792	148	-19024	63
-16443	43	-16534	43	-16686	148	-16793	148	-19025	63
-16444	43	-16535	43	-16687	148	-16794	148	-19026	75
-16446	43	-16536	43	-16688	150	-16795	148	-19027	75
-16447	43	-16537	43	-16689	148	-16796	148	-19028	51
-16448	43	-16538	43	-16691	148	-16797	148	-19029	52
-16449	43	-16539	43	-16692	148	-16798	148	-19030	53
-16450	43	-16540	43	-16693	148	-16799	148	-19031	91
-16451	43	-16541	43	-16694	148	-16800	148	-19032	85
-16453	43	-16542	43	-16695	148	-16801	148	-19033	95
-16454	43	-16543	43	-16696	148	-16802	148	-19034	97
-16455	43	-16544	43	-16697	148	-16803	65	-19035	26
-16456	43	-16602	65	-16698	148	-16804	65	-19036	36
-16457	43	-16603	65	-16699	148	-16805	65	-19037	47
-16458	43	-16604	65	-16700	148	-16806	65	-19038	37
-16459	123	-16605	65	-16701	148	-16807	65	-19039	84
-16460	123	-16606	65	-16702	65	-16808	65	-19040	24
-16461	123	-16607	65	-16703	65	-16809	65	-19046	33
-16462	123	-16609	65	-16704	65	-16810	65	-19047	33
-16463	125	-16610	65	-16705	65	-16811	65	-19048	106
-16464	123	-16611	65	-16706	65	-16812	65	-19049	5/115
-16465	123	-16612	65	-16707	65	-16813	65	-19050	5/115
-16466	123	-16613	65	-16708	65	-16814	65	-19051	13
-16467	123	-16614	65	-16709	65	-16815	120	-19052	13
-16468	43	-16616	65	-16710	65	-16816	120	-19053	15/115
-16469	43	-16617	65	-16711	65	-16851	29	-19054	15/115
-16470	43	-16618	65	-16712	65	-16852	29	-19055	15/115
-16471	43	-16619	65	-16713	65	-16853	29	-19056	19
-16472	43	-16620	65	-16716	117	-16854	29	-19057	19
-16473	43	-16621	65	-16717	117	-16855	29	-19058	21
-16474	43	-16623	65	-16718	117	-16856	29	-19059	21
-16475	43	-16624	65	-16719	117	-16857	29	-19060	23
-16476	43	-16625	65	-16722	120	-16858	29	-19061	108
-16477	43	-16626	65	-16723	120	-18030	109	-19062	109
-16478	43	-16627	65	-16732	65	-18031	109	-19063	109
-16479	43	-16628	65	-16733	65	-18032	109	-19064	35
-16480	123	-16630	124	-16734	65	-18035	109	-19065	35
-16481	123	-16631	124	-16735	65	-18041	109	-19066	45
-16482	123	-16632	124	-16736	65	-18045	109	-19067	45
-16483	123	-16633	124	-16737	65	-18051	109	-19068	83
-16484	147	-16634	124	-16739	65	-18161	111	-19069	83
-16485	147	-16635	125	-16740	65	-18211	23	-19070	67
-16486	147	-16636	124	-16741	65	-18212	23	-19071	67
-16487	147	-16637	124	-16742	65	-18213	23	-19072	73
-16488	147	-16638	124	-16743	65	-18214	23	-19073	73
-16489	147	-16639	65	-16744	65	-18215	23	-19074	63
-16490	150	-16640	65	-16746	65	-18216	23	-19075	63
-16491	147	-16641	65	-16747	65	-18221	23	-19076	75
-16492	147	-16642	65	-16748	65	-18222	23	-19077	75
-16493	147	-16643	65	-16749	65	-18223	23	-19078	51
-16494	147	-16644	65	-16750	65	-18224	23	-19079	52
-16495	147	-16645	65	-16751	65	-18225	23	-19080	53
-16496	147	-16646	65	-16753	65	-18226	23	-19081	91
-16497	147	-16647	65	-16754	65	-18252	132	-19082	85
-16498	147	-16648	65	-16755	65	-18254	132	-19083	95
-16499	147	-16649	65	-16756	65	-18255	132	-19084	97
-16500	147	-16650	65	-16757	65	-18256	132	-19085	26
-16501	147	-16651	124	-16758	65	-18257	136	-19086	36
-16502	147	-16652	124	-16759	124	-18262	132	-19087	47
-16503	43	-16653	124	-16760	124	-18264	132	-19088	37
-16504	43	-16654	124	-16761	124	-18265	132	-19089	84
-16505	43	-16655	135	-16762	124	-18266	132	-19090	24
-16506	43	-16656	135	-16763	125	-18267	136	-19096	33
-16507	43	-16657	135	-16764	124	-18272	132	-19097	33
-16508	43	-16658	135	-16765	124	-18276	132	-19098	106
-16509	43	-16659	135	-16766	124	-18277	136	-19099	5/115
-16510	43	-16660	135	-16767	124	-18286	132	-19100	5/115
-16511	43	-16661	135	-16768	65	-18287	136	-19101	13
-16512	43	-16662	135	-16769	65	-19001	13	-19102	13
-16513	43	-16663	135	-16770	65	-19002	13	-19103	15/115
-16514	43	-16664	135	-16771	65	-19003	15/115	-19104	15/115
-16515	120	-16665	135	-16772	65	-19004	15/115	-19105	15/115
-16516	120	-16666	135	-16773	65	-19005	15/115	-19106	19
		-16667	135	-16774	65	-19006	19	-19107	19
		-16668	135	-16775	65	-19007	19	-19108	21

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Cat.No. INDEX

5020

-19109	21	-19210	23	-19331	91	-19454	15/115	-19557	19
-19110	23	-19211	108	-19332	85	-19455	15/115	-19558	21
-19111	108	-19214	35	-19333	95	-19456	19	-19559	21
-19112	109	-19215	35	-19334	97	-19457	19	-19560	23
-19113	109	-19216	45	-19346	33	-19458	21	-19561	108
-19114	35	-19217	45	-19347	33	-19459	21	-19562	109
-19115	35	-19218	83	-19349	5/115	-19460	23	-19563	109
-19116	45	-19219	83	-19350	5/115	-19461	108	-19564	35
-19117	45	-19220	67	-19351	13	-19462	109	-19565	35
-19118	83	-19221	67	-19352	13	-19463	109	-19566	45
-19119	83	-19222	73	-19353	15/115	-19464	35	-19567	45
-19120	67	-19223	73	-19354	15/115	-19465	35	-19568	83
-19121	67	-19224	63	-19355	15/115	-19466	45	-19569	83
-19122	73	-19225	63	-19356	19	-19467	45	-19570	67
-19123	73	-19226	75	-19357	19	-19468	83	-19571	67
-19124	63	-19227	75	-19358	21	-19469	83	-19572	73
-19125	63	-19228	51	-19359	21	-19470	67	-19573	73
-19126	75	-19229	52	-19360	23	-19471	67	-19574	63
-19127	75	-19230	53	-19361	108	-19472	73	-19575	63
-19128	51	-19231	91	-19364	35	-19473	73	-19576	75
-19129	52	-19232	85	-19365	35	-19474	63	-19577	75
-19130	53	-19233	95	-19366	45	-19475	63	-19578	51
-19131	91	-19234	97	-19367	45	-19476	75	-19579	52
-19132	85	-19246	33	-19368	83	-19477	75	-19580	53
-19133	95	-19247	33	-19369	83	-19478	51	-19581	91
-19134	97	-19249	5/115	-19370	67	-19479	52	-19582	85
-19135	26	-19250	5/115	-19371	67	-19480	53	-19583	95
-19136	36	-19251	13	-19372	73	-19481	91	-19584	97
-19137	47	-19252	13	-19373	73	-19482	85	-19585	26
-19138	37	-19253	15/115	-19374	63	-19483	95	-19586	36
-19139	84	-19254	15/115	-19375	63	-19484	97	-19587	47
-19140	24	-19255	15/115	-19376	75	-19485	26	-19588	37
-19146	33	-19256	19	-19377	75	-19486	36	-19589	84
-19147	33	-19257	19	-19378	51	-19487	47	-19590	24
-19149	5/115	-19258	21	-19379	52	-19488	37	-19596	33
-19150	5/115	-19259	21	-19380	53	-19489	84	-19597	33
-19151	13	-19260	23	-19381	91	-19490	24	-19599	5/115
-19152	13	-19261	108	-19382	85	-19496	33	-19600	5/115
-19153	15/115	-19264	35	-19383	95	-19497	33	-19701	116
-19154	15/115	-19265	35	-19384	97	-19499	5/115	-19703	116
-19155	15/115	-19266	45	-19396	33	-19500	5/115	-19706	116
-19156	19	-19267	45	-19397	33	-19501	13	-19708	116
-19157	19	-19268	83	-19399	5/115	-19502	13	-19710	116
-19158	21	-19269	83	-19400	5/115	-19503	15/115	-19716	117
-19159	21	-19270	67	-19401	13	-19504	15/115	-19718	117
-19160	23	-19271	67	-19402	13	-19505	15/115	-19720	117
-19161	108	-19272	73	-19403	15/115	-19506	19	-19722	117
-19162	109	-19273	73	-19404	15/115	-19507	19	-19724	117
-19163	109	-19274	63	-19405	15/115	-19508	21	-19726	117
-19164	35	-19275	63	-19406	19	-19509	21	-19728	117
-19165	35	-19276	75	-19407	19	-19510	23	-19731	117
-19166	45	-19277	75	-19408	21	-19511	108	-19735	116
-19167	45	-19278	51	-19409	21	-19512	109	-19746	117
-19168	83	-19279	52	-19410	23	-19513	109	-19749	116
-19169	83	-19280	53	-19411	108	-19514	35	-19751	116
-19170	67	-19281	91	-19412	109	-19515	35	-19753	116
-19171	67	-19282	85	-19413	109	-19516	45	-19756	116
-19172	73	-19283	95	-19414	35	-19517	45	-19758	116
-19173	73	-19284	97	-19415	35	-19518	83	-19760	116
-19174	63	-19296	33	-19416	45	-19519	83	-19766	117
-19175	63	-19297	33	-19417	45	-19520	67	-19768	117
-19176	75	-19299	5/115	-19418	83	-19521	67	-19770	117
-19177	75	-19300	5/115	-19419	83	-19522	73	-19772	117
-19178	51	-19301	13	-19420	67	-19523	73	-19774	117
-19179	52	-19302	13	-19421	67	-19524	63	-19776	117
-19180	53	-19303	15/115	-19422	73	-19525	63	-19778	117
-19181	91	-19304	15/115	-19423	73	-19526	75	-19781	117
-19182	85	-19305	15/115	-19424	63	-19527	75	-19785	116
-19183	95	-19306	19	-19425	63	-19528	51	-19796	117
-19184	97	-19307	19	-19426	75	-19529	52	-19799	116
-19185	26	-19308	21	-19427	75	-19530	53	-19801	116
-19186	36	-19309	21	-19428	51	-19531	91	-19803	116
-19187	47	-19310	23	-19429	52	-19532	85	-19806	116
-19188	37	-19311	108	-19430	53	-19533	95	-19808	116
-19189	84	-19314	35	-19431	91	-19534	97	-19810	116
-19190	24	-19315	35	-19432	85	-19535	26	-19816	117
-19196	33	-19316	45	-19433	95	-19536	36	-19818	117
-19197	33	-19317	45	-19434	97	-19537	47	-19820	117
-19199	5/115	-19318	83	-19435	26	-19538	37	-19822	117
-19200	5/115	-19319	83	-19436	36	-19539	84	-19824	117
-19201	13	-19320	67	-19437	47	-19540	24	-19826	117
-19202	13	-19321	67	-19438	37	-19546	33	-19828	117
-19203	15/115	-19322	73	-19439	84	-19547	33	-19831	117
-19204	15/115	-19323	73	-19440	24	-19549	5/115	-19835	116
-19205	15/115	-19324	63	-19446	33	-19550	5/115	-19846	117
-19206	19	-19325	63	-19447	33	-19551	13	-19849	116
-19207	19	-19326	75	-19449	5/115	-19552	13	-19851	116
-19208	21	-19327	75	-19450	5/115	-19553	15/115	-19853	116
-19209	21	-19328	51	-19451	13	-19554	15/115	-19856	116
		-19329	52	-19452	13	-19555	15/115	-19858	116
		-19330	53	-19453	15/115	-19556	19	-19860	116

5020

-19866	117	-20217	120	-20376	119	-79023	132	-79118	131
-19868	117	-20218	120	-20377	118	-79024	132	-79119	136
-19870	117	-20219	120	-20378	119	-79025	136	-79120	131
-19872	117	-20220	120	-20379	118	-79026	132	-79121	136
-19874	117	-20221	120	-20381	119	-79027	132	-79300	133
-19876	117	-20222	120	-20382	118	-79028	132	-79301	133
-19878	117	-20223	120	-20383	119	-79029	132	-79302	133
-19881	117	-20224	120	-20384	119	-79030	136	-79303	133
-19885	116	-20225	120	-20385	118	-79031	133	-79304	137
-19896	117	-20226	120	-20386	118	-79032	133	-79305	133
-19899	116	-20227	120	-20387	118	-79033	133	-79306	133
-20101	120	-20228	120	-20389	119	-79034	133	-79307	133
-20102	120	-20229	120	-20390	119	-79035	137	-79308	133
-20103	120	-20230	120	-20391	118	-79036	133	-79309	137
-20104	120	-20231	120	-20392	119	-79037	133	-79310	133
-20105	120	-20232	120	-20393	119	-79038	133	-79311	133
-20106	120	-20233	120	-20394	118	-79039	133	-79312	133
-20107	120	-20234	120	-20395	119	-79040	137	-79313	133
-20108	120	-20243	120	-20396	118	-79041	134	-79314	137
-20109	120	-20244	120	-20398	119	-79042	134	-79315	133
-20110	120	-20245	120	-20399	118	-79043	134	-79316	133
-20114	120	-20246	120	-20400	119	-79044	134	-79317	133
-20115	120	-20247	120	-20401	119	-79045	137	-79318	133
-20116	120	-20248	120	-30112	17	-79046	135	-79319	137
-20117	120	-20300	118	-30113	17	-79047	135	-79320	133
-20118	120	-20301	118	-30114	17	-79048	135	-79321	137
-20119	120	-20302	118	-30115	17	-79049	135	-80011	97
-20120	120	-20304	119	-30116	17	-79050	138	-80012	97
-20121	120	-20305	119	-30122	17	-79051	135	-80013	97
-20122	120	-20306	118	-30123	17	-79052	135	-80014	97
-20123	120	-20307	119	-30124	17	-79053	135	-80015	97
-20124	120	-20308	119	-30125	17	-79054	135	-80016	97
-20125	120	-20309	118	-30126	17	-79055	138	-80021	97
-20126	120	-20310	119	-30132	17	-79056	135	-80022	97
-20127	120	-20311	118	-30133	17	-79057	135	-80023	97
-20128	120	-20313	119	-30134	17	-79058	135	-80024	97
-20129	120	-20314	118	-30135	17	-79059	135	-80025	97
-20130	120	-20315	119	-30136	17	-79060	138	-80026	97
-20131	120	-20316	119	-30142	17	-79061	134	-80111	95
-20132	120	-20317	118	-30143	17	-79062	134	-80112	95
-20133	120	-20318	118	-30144	17	-79063	134	-80113	95
-20135	120	-20319	118	-30145	17	-79064	134	-80114	95
-20139	120	-20321	119	-30146	17	-79065	137	-80115	95
-20143	120	-20322	119	-30212	16	-79066	134	-80116	95
-20144	120	-20323	118	-30213	16	-79067	134	-80121	95
-20145	120	-20324	119	-30214	16	-79068	134	-80122	95
-20146	120	-20325	119	-30215	16	-79069	134	-80123	95
-20147	61	-20326	118	-30216	16	-79070	137	-80124	95
-20148	61	-20327	119	-30222	16	-79071	134	-80125	95
-20149	61	-20328	118	-30223	16	-79072	134	-80126	95
-20150	61	-20330	119	-30224	16	-79073	134	-81011	13
-20151	61	-20331	118	-30225	16	-79074	134	-81012	13
-20152	61	-20332	119	-30226	16	-79075	137	-81013	13
-20153	61	-20333	119	-30232	16	-79076	134	-81014	13
-20154	61	-20334	118	-30233	16	-79077	134	-81015	13
-20155	61	-20335	118	-30234	16	-79078	134	-81016	13
-20156	61	-20336	118	-30235	16	-79079	134	-81021	13
-20157	61	-20338	119	-30236	16	-79080	137	-81022	13
-20158	61	-20339	119	-30242	16	-79081	134	-81023	13
-20159	61	-20340	118	-30243	16	-79082	134	-81024	13
-20160	61	-20341	119	-30244	16	-79083	134	-81025	13
-20161	61	-20342	119	-30245	16	-79084	134	-81026	13
-20162	61	-20343	118	-30246	16	-79085	137	-81053	131
-20163	61	-20344	119	-41100	110	-79086	135	-81054	131
-20164	61	-20345	118	-41101	110	-79087	135	-81055	131
-20165	61	-20347	119	-41102	110	-79088	135	-81056	131
-20166	61	-20348	118	-41103	110	-79089	135	-81057	136
-20167	61	-20349	119	-41104	110	-79090	138	-81063	131
-20168	61	-20350	119	-41105	110	-79091	135	-81064	131
-20169	61	-20351	118	-79001	131	-79092	135	-81065	131
-20170	61	-20352	118	-79002	131	-79093	135	-81066	131
-20175	117	-20353	118	-79003	131	-79094	135	-81067	136
-20177	117	-20355	119	-79004	131	-79095	138	-81111	13
-20179	117	-20356	119	-79005	136	-79100	131	-81112	13
-20181	117	-20357	118	-79006	132	-79101	131	-81113	13
-20189	120	-20358	119	-79007	132	-79102	131	-81114	13
-20190	120	-20359	119	-79008	132	-79103	131	-81115	13
-20201	120	-20360	118	-79009	132	-79104	136	-81116	13
-20202	120	-20361	119	-79010	137	-79105	131	-81121	13
-20203	120	-20362	118	-79011	131	-79106	131	-81122	13
-20204	120	-20364	119	-79012	131	-79107	131	-81123	13
-20205	120	-20365	118	-79013	131	-79108	131	-81124	13
-20206	120	-20366	119	-79014	131	-79109	136	-81125	13
-20207	120	-20367	119	-79015	136	-79110	131	-81126	13
-20208	120	-20368	118	-79016	132	-79111	131	-81200	13
-20209	120	-20369	118	-79017	132	-79112	131	-81202	13
-20210	120	-20370	118	-79018	132	-79113	131	-81203	13
-20214	120	-20372	119	-79019	132	-79114	136	-81204	13
-20215	120	-20373	119	-79020	136	-79115	131	-81205	13
-20216	120	-20374	118	-79021	132	-79116	131	-81210	13
		-20375	119	-79022	132	-79117	131	-81212	13

Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
------------------------	---------------	----------------------	-------------	----------------------	------------------------------	---------------	---------------------	-------------------	--------------	----------------

Cat.No. INDEX

5020

-81213	13	-84512	15	-84965	133	-85366	134	-85844	134
-81214	13	-84513	15	-84966	133	-85367	137	-85845	134
-81215	13	-84514	15	-84967	137	-85372	134	-85846	134
-81221	33	-84521	15	-84972	133	-85376	134	-85847	137
-81222	33	-84522	15	-84976	133	-85377	137	-85852	134
-81223	33	-84523	15	-84977	137	-85386	134	-85856	134
-81224	33	-84524	15	-84986	133	-85387	137	-85857	137
-81225	33	-84650	14	-84987	137	-85511	67	-85866	134
-81226	33	-84652	14	-85011	45	-85512	67	-85867	137
-81231	33	-84653	14	-85012	45	-85513	67	-85911	91
-81232	33	-84654	14	-85013	45	-85514	67	-85912	91
-81233	33	-84655	14	-85014	45	-85515	67	-85913	91
-81234	33	-84660	14	-85021	45	-85516	67	-85914	91
-81235	33	-84662	14	-85022	45	-85521	67	-85915	91
-81236	33	-84663	14	-85023	45	-85522	67	-85916	91
-81243	132	-84664	14	-85024	45	-85523	67	-85921	91
-81244	132	-84665	14	-85111	45	-85524	67	-85922	91
-81245	132	-84711	21	-85112	45	-85525	67	-85923	91
-81246	132	-84712	21	-85113	45	-85526	67	-85924	91
-81247	137	-84713	21	-85114	45	-85531	67	-85925	91
-81253	132	-84714	21	-85116	45	-85532	67	-85926	91
-81254	132	-84715	21	-85121	45	-85533	67	-85932	91/135
-81255	132	-84716	21	-85122	45	-85534	67	-85934	91/135
-81256	132	-84721	21	-85123	45	-85535	67	-85935	91/135
-81257	137	-84722	21	-85124	45	-85536	67	-85936	91/135
-81261	33	-84723	21	-85126	45	-85541	67	-85937	138
-81262	33	-84724	21	-85130	45	-85542	67	-85942	135
-81263	33	-84725	21	-85131	45	-85543	67	-85944	135
-81264	33	-84726	21	-85132	45	-85544	67	-85945	135
-81265	33	-84731	21	-85133	45	-85545	67	-85946	135
-81266	33	-84732	21	-85134	45	-85546	67	-85947	138
-81271	33	-84733	21	-85135	45	-85552	135	-85952	135
-81272	33	-84734	21	-85136	45	-85554	135	-85956	135
-81273	33	-84735	21	-85137	45	-85555	135	-85957	138
-81274	33	-84736	21	-85138	45	-85556	135	-85966	135
-81275	33	-84741	21	-85139	45	-85557	138	-85967	138
-81276	33	-84742	21	-85152	133	-85562	135	-86011	85
-81280	33	-84743	21	-85154	133	-85564	135	-86012	85
-81282	33	-84744	21	-85155	133	-85565	135	-86013	85
-81283	33	-84745	21	-85156	133	-85566	135	-86014	85
-81284	33	-84746	21	-85157	137	-85567	138	-86015	85
-81285	33	-84752	132	-85162	133	-85572	135	-86016	85
-81290	33	-84754	132	-85164	133	-85576	135	-86021	85
-81292	33	-84755	132	-85165	133	-85577	138	-86022	85
-81293	33	-84756	132	-85166	133	-85586	135	-86023	85
-81294	33	-84757	136	-85167	137	-85587	138	-86024	85
-81295	33	-84762	132	-85172	133	-85711	52	-86025	85
-84211	75	-84764	132	-85176	133	-85712	52	-86026	85
-84212	75	-84765	132	-85177	137	-85713	52	-86032	135
-84213	75	-84766	132	-85186	133	-85714	52	-86034	135
-84214	75	-84767	136	-85187	137	-85715	52	-86035	135
-84221	75	-84772	132	-85252	132	-85716	52	-86036	135
-84222	75	-84776	132	-85254	132	-85721	52	-86037	138
-84223	75	-84777	136	-85255	132	-85722	52	-86042	135
-84224	75	-84786	132	-85256	132	-85723	52	-86044	135
-84311	75	-84787	136	-85257	136	-85724	52	-86045	135
-84312	75	-84811	35	-85262	132	-85725	52	-86046	135
-84313	75	-84812	35	-85264	132	-85726	52	-86047	138
-84314	75	-84813	35	-85265	132	-85732	134	-86052	135
-84316	75	-84814	35	-85266	132	-85734	134	-86056	135
-84321	75	-84821	35	-85267	136	-85735	134	-86057	138
-84322	75	-84822	35	-85311	83	-85736	134	-86066	135
-84323	75	-84823	35	-85312	83	-85737	137	-86067	138
-84324	75	-84824	35	-85313	83	-85742	134	-86111	53
-84326	75	-84911	35	-85314	83	-85744	134	-86112	53
-84352	135	-84912	35	-85316	83	-85745	134	-86113	53
-84354	135	-84913	35	-85321	83	-85746	134	-86114	53
-84355	135	-84914	35	-85322	83	-85747	137	-86115	53
-84356	135	-84916	35	-85323	83	-85752	134	-86116	53
-84357	138	-84921	35	-85324	83	-85756	134	-86121	53
-84362	135	-84922	35	-85326	83	-85757	137	-86122	53
-84364	135	-84923	35	-85331	83	-85766	134	-86123	53
-84365	135	-84924	35	-85332	83	-85767	137	-86124	53
-84366	135	-84926	35	-85333	83	-85811	51	-86125	53
-84372	135	-84930	35	-85334	83	-85812	51	-86126	53
-84376	135	-84931	35	-85335	83	-85813	51	-86132	134
-84377	138	-84932	35	-85336	83	-85814	51	-86134	134
-84386	135	-84933	35	-85341	83	-85815	51	-86135	134
-84387	138	-84934	35	-85342	83	-85816	51	-86136	134
-84411	15	-84935	35	-85343	83	-85821	51	-86137	137
-84412	15	-84936	35	-85344	83	-85822	51	-86142	134
-84413	15	-84937	35	-85345	83	-85823	51	-86144	134
-84414	15	-84938	35	-85346	83	-85824	51	-86145	134
-84421	15	-84939	35	-85352	134	-85825	51	-86146	134
-84422	15	-84952	133	-85354	134	-85826	51	-86147	137
-84423	15	-84954	133	-85355	134	-85832	134	-86152	134
-84424	15	-84955	133	-85356	134	-85834	134	-86156	134
-84511	15	-84956	133	-85357	137	-85835	134	-86157	137
		-84957	137	-85362	134	-85836	134	-86166	134
		-84962	133	-85364	134	-85837	137	-86167	137
		-84964	133	-85365	134	-85842	134	-86511	73

5020

-86512	73	-86831	61	-87104	11	-87199	144	-87296	144
-86513	73	-86832	61	-87105	11	-87200	144	-87297	144
-86514	73	-86833	61	-87106	11	-87201	144	-87298	144
-86515	73	-86834	61	-87107	11	-87202	144	-87299	144
-86516	73	-86835	61	-87108	11	-87203	144	-87300	144
-86521	73	-86836	61	-87110	11	-87204	144	-87301	11/115
-86522	73	-86841	61	-87111	11	-87205	11/115	-87302	11/115
-86523	73	-86842	61	-87112	11	-87206	11/115	-87303	11/115
-86524	73	-86843	61	-87113	11	-87207	11/115	-87304	11/115
-86525	73	-86844	61	-87114	11	-87208	11/115	-87305	11/115
-86526	73	-86845	61	-87115	11	-87209	11/115	-87306	11/115
-86531	73	-86846	61	-87116	11	-87210	11/115	-87307	11/115
-86532	73	-86852	134	-87118	11	-87211	11/115	-87308	11/115
-86533	73	-86854	134	-87119	11	-87212	11/115	-87309	11/115
-86534	73	-86855	134	-87120	11	-87213	11/115	-87310	11/115
-86535	73	-86856	134	-87121	11	-87214	11/115	-87311	11/115
-86536	73	-86857	137	-87122	11	-87215	11/115	-87312	11/115
-86541	73	-86862	134	-87123	11	-87216	11/115	-87313	120
-86542	73	-86864	134	-87124	11	-87217	116	-87314	120
-86543	73	-86865	134	-87126	11	-87218	116	-87315	11
-86544	73	-86866	134	-87127	11	-87219	116	-87316	11
-86545	73	-86867	137	-87128	11	-87220	116	-87317	11
-86546	73	-86872	134	-87129	11	-87223	120	-87318	11
-86552	135	-86876	134	-87130	11	-87224	120	-87319	11
-86553	135	-86877	137	-87131	11	-87226	11	-87320	11
-86554	135	-86886	134	-87132	11	-87227	11	-87321	11
-86555	135	-86887	137	-87133	121	-87228	11	-87322	11
-86556	135	-87000	110	-87134	121	-87229	11	-87323	11
-86557	138	-87002	111	-87135	121	-87230	11	-87324	11
-86562	135	-87003	111	-87136	121	-87231	11	-87325	11
-86564	135	-87004	111	-87137	125	-87232	11	-87326	11
-86565	135	-87005	110	-87138	121	-87234	11	-87327	11
-86566	135	-87008	110	-87139	121	-87235	11	-87328	11
-86567	138	-87009	110	-87140	121	-87236	11	-87329	11
-86572	135	-87010	110	-87141	121	-87237	11	-87330	11
-86576	135	-87011	110	-87142	11	-87238	11	-87331	11
-86577	138	-87012	111	-87143	11	-87239	11	-87332	11
-86586	135	-87013	111	-87144	11	-87240	11	-87333	118
-86587	138	-87014	111	-87145	11	-87242	11	-87334	118
-86711	63	-87015	111	-87146	11	-87243	11	-87335	118
-86712	63	-87016	111	-87147	11	-87244	11	-87336	118
-86713	63	-87017	111	-87148	11	-87245	11	-87337	118
-86714	63	-87018	111	-87149	11	-87246	11	-87338	118
-86715	63	-87019	111	-87150	11	-87247	11	-87400	100
-86716	63	-87020	111	-87151	11	-87248	11	-87401	100
-86721	63	-87021	110	-87152	11	-87250	11	-87402	100
-86722	63	-87022	110	-87153	11	-87251	11	-87403	100
-86723	63	-87023	110	-87154	121	-87252	11	-87404	100
-86724	63	-87024	110	-87155	121	-87253	11	-87405	100
-86725	63	-87025	110	-87156	121	-87254	11	-87412	100
-86726	63	-87026	110	-87157	121	-87255	11	-87413	100
-86731	63	-87028	110	-87158	131	-87256	11	-87414	100
-86732	63	-87030	110	-87159	131	-87257	121	-87415	100
-86733	63	-87031	110	-87160	131	-87258	121	-87416	100
-86734	63	-87032	110	-87161	131	-87259	121	-87417	100
-86735	63	-87033	110	-87162	131	-87260	121	-87418	100
-86736	63	-87034	111	-87163	131	-87261	125	-87419	100
-86741	63	-87035	110	-87164	131	-87262	121	-87420	101
-86742	63	-87037	110	-87165	131	-87263	121	-87421	101
-86743	63	-87038	111	-87166	131	-87264	121	-87422	101
-86744	63	-87040	110	-87167	131	-87265	121	-87423	101
-86745	63	-87041	111	-87168	131	-87266	11	-87424	101
-86746	63	-87042	111	-87169	131	-87267	11	-87425	101
-86752	134	-87043	110	-87170	131	-87268	11	-87426	101
-86754	134	-87044	111	-87171	131	-87269	11	-87427	101
-86755	134	-87045	110	-87172	131	-87270	11	-87436	101
-86756	134	-87047	110	-87173	131	-87271	11	-87437	101
-86757	137	-87049	100	-87174	131	-87272	11	-87438	101
-86762	134	-87050	100	-87175	131	-87273	11	-87439	101
-86764	134	-87051	100	-87176	131	-87274	11	-87440	101
-86765	134	-87052	100	-87177	131	-87275	11	-87441	101
-86766	134	-87053	100	-87178	136	-87276	11	-87442	101
-86767	137	-87054	100	-87179	136	-87277	11	-87443	101
-86772	134	-87055	100	-87180	136	-87278	121	-87444	101
-86776	134	-87056	100	-87181	136	-87279	121	-87445	101
-86777	137	-87057	100	-87182	136	-87280	121	-87446	101
-86786	134	-87058	100	-87183	139	-87281	121	-87447	101
-86787	137	-87059	100	-87184	139	-87282	144	-87448	101
-86811	61	-87060	100	-87185	144	-87283	144	-87449	101
-86812	61	-87061	100	-87186	144	-87284	144	-87450	101
-86813	61	-87062	100	-87187	144	-87285	144	-87451	101
-86814	61	-87063	100	-87188	144	-87286	144	-87452	101
-86815	61	-87064	100	-87189	144	-87287	144	-87453	101
-86816	61	-87065	100	-87190	144	-87288	150	-87454	101
-86821	61	-87066	100	-87191	150	-87289	144	-87455	101
-86822	61	-87067	100	-87193	144	-87290	144	-87456	101
-86823	61	-87068	100	-87194	144	-87291	144	-87457	101
-86824	61	-87069	100	-87195	144	-87292	144	-87458	101
-86825	61	-87070	100	-87196	144	-87293	144	-87459	101
-86826	61	-87102	11	-87197	144	-87294	144	-87460	101
		-87103	11	-87198	144	-87295	144	-87461	101

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Cat.No. INDEX

5020

-87462	101	-87563	100	-87758	133	-87855	39	-88015	9
-87463	101	-87564	100	-87759	133	-87856	39	-88016	9
-87464	101	-87565	100	-87760	133	-87857	39	-88017	9
-87465	101	-87566	100	-87761	133	-87858	39	-88018	9
-87466	101	-87567	100	-87762	133	-87859	122	-88019	9
-87467	101	-87568	100	-87763	133	-87860	122	-88020	9
-87468	100	-87569	100	-87764	133	-87861	122	-88022	9
-87469	100	-87570	101	-87765	133	-87862	122	-88023	9
-87470	100	-87571	101	-87766	133	-87863	125	-88024	9
-87471	100	-87572	101	-87767	133	-87864	122	-88025	9
-87472	100	-87573	101	-87768	133	-87865	122	-88026	9
-87473	100	-87574	101	-87769	133	-87866	122	-88027	9
-87474	100	-87575	101	-87770	133	-87867	122	-88029	121
-87475	100	-87576	101	-87771	133	-87868	39	-88030	121
-87476	101	-87577	101	-87772	133	-87869	39	-88031	121
-87477	101	-87578	101	-87773	133	-87870	39	-88032	121
-87478	101	-87579	101	-87774	133	-87871	39	-88033	125
-87479	101	-87580	101	-87775	133	-87872	39	-88034	121
-87480	101	-87581	101	-87776	133	-87873	39	-88035	121
-87481	101	-87582	101	-87777	137	-87874	39	-88036	121
-87482	101	-87583	101	-87778	137	-87875	39	-88037	121
-87483	101	-87584	101	-87779	137	-87876	39	-88038	9
-87492	101	-87585	101	-87780	137	-87877	39	-88039	9
-87493	101	-87586	101	-87781	137	-87878	39	-88040	9
-87494	101	-87587	101	-87783	139	-87879	39	-88041	9
-87495	101	-87588	101	-87785	146	-87880	122	-88042	9
-87496	101	-87589	101	-87786	146	-87881	122	-88043	9
-87497	101	-87590	101	-87787	146	-87882	122	-88044	9
-87498	101	-87591	101	-87788	146	-87883	122	-88045	9
-87499	101	-87592	101	-87789	146	-87884	147	-88046	9
-87500	101	-87593	101	-87791	147	-87885	147	-88047	9
-87501	101	-87594	101	-87792	147	-87886	147	-88048	9
-87502	101	-87595	101	-87793	147	-87887	147	-88049	9
-87503	101	-87596	101	-87794	147	-87888	147	-88050	121
-87504	101	-87597	101	-87795	147	-87889	147	-88051	121
-87505	101	-87598	101	-87796	147	-87891	147	-88052	121
-87506	101	-87599	101	-87797	147	-87892	147	-88053	121
-87507	101	-87600	101	-87798	147	-87893	147	-88054	131
-87508	101	-87601	101	-87799	147	-87894	147	-88055	131
-87509	101	-87602	101	-87800	147	-87895	147	-88056	131
-87510	101	-87603	101	-87801	147	-87896	147	-88057	131
-87511	101	-87604	101	-87802	147	-87897	147	-88058	131
-87512	101	-87605	101	-87803	39	-87898	147	-88059	131
-87513	101	-87606	101	-87804	39	-87899	147	-88060	131
-87514	101	-87701	39	-87805	39	-87900	147	-88061	131
-87515	101	-87702	39	-87806	39	-87901	147	-88062	131
-87516	102	-87703	39	-87807	39	-87902	147	-88063	131
-87517	102	-87704	39	-87808	39	-87903	39	-88064	131
-87518	102	-87705	39	-87809	39	-87904	39	-88065	131
-87519	102	-87706	39	-87810	39	-87905	39	-88066	131
-87520	102	-87707	39	-87811	39	-87906	39	-88067	131
-87521	102	-87709	39	-87812	39	-87907	39	-88068	131
-87522	102	-87710	39	-87813	39	-87908	39	-88069	131
-87523	102	-87711	39	-87814	39	-87909	39	-88070	131
-87524	102	-87712	39	-87815	117	-87910	39	-88071	131
-87525	102	-87713	39	-87816	117	-87911	39	-88072	131
-87526	102	-87714	39	-87817	117	-87912	39	-88073	131
-87527	102	-87715	39	-87818	117	-87913	39	-88074	136
-87532	100	-87717	39	-87818	120	-87914	39	-88075	136
-87533	100	-87718	39	-87819	120	-87915	120	-88076	136
-87534	100	-87719	39	-87821	119	-87916	120	-88077	136
-87535	100	-87720	39	-87822	119	-87917	39	-88078	136
-87536	100	-87721	39	-87823	119	-87918	39	-88079	139
-87537	100	-87722	39	-87824	119	-87919	39	-88080	139
-87538	100	-87723	39	-87825	119	-87920	39	-88081	144
-87539	100	-87724	39	-87826	119	-87921	39	-88082	144
-87540	100	-87725	39	-87827	39	-87922	39	-88083	144
-87541	100	-87726	39	-87828	39	-87923	39	-88084	144
-87542	100	-87727	39	-87829	39	-87924	39	-88085	144
-87543	100	-87728	39	-87830	39	-87925	39	-88086	144
-87544	100	-87729	39	-87831	39	-87926	39	-88087	150
-87545	100	-87730	39	-87832	39	-87927	39	-88089	144
-87546	100	-87731	39	-87833	39	-87928	39	-88090	144
-87547	100	-87732	125	-87834	39	-87929	39	-88091	144
-87548	100	-87741	39	-87835	39	-87930	39	-88092	144
-87549	100	-87742	39	-87836	39	-87931	39	-88093	144
-87550	100	-87743	39	-87837	39	-87932	39	-88094	144
-87551	100	-87744	39	-87838	39	-87933	39	-88095	144
-87552	100	-87745	39	-87839	39	-87934	39	-88096	144
-87553	100	-87746	39	-87840	39	-88001	9	-88097	144
-87554	100	-87747	39	-87841	39	-88002	9	-88098	144
-87555	100	-87748	39	-87842	39	-88003	9	-88099	144
-87556	100	-87749	39	-87843	39	-88004	9	-88100	144
-87557	100	-87750	39	-87844	39	-88005	9	-88101	9
-87558	100	-87751	39	-87845	39	-88006	9	-88102	9
-87559	100	-87752	39	-87846	39	-88007	9	-88103	9
-87560	100	-87753	122	-87847	39	-88008	9	-88104	9
-87561	100	-87754	122	-87848	39	-88009	9	-88105	9
-87562	100	-87755	122	-87849	39	-88010	9	-88106	9
		-87756	122	-87850	39	-88011	9	-88107	9
		-87757	133	-87851	39	-88012	9	-88108	9
				-87852	39	-88013	9		

5020

-88109.....9	-88206.....9	-88355.....122	-88453.....31	-88544.....119
-88110.....9	-88207.....120	-88356.....122	-88454.....31	-88602.....59
-88111.....9	-88208.....120	-88357.....122	-88455.....31	-88603.....59
-88112.....9	-88210.....9	-88358.....132	-88456.....31	-88604.....59
-88115.....116	-88212.....9	-88359.....132	-88457.....122	-88605.....59
-88116.....116	-88213.....9	-88360.....132	-88458.....122	-88606.....59
-88117.....116	-88214.....9	-88361.....132	-88459.....122	-88607.....59
-88118.....116	-88216.....9	-88362.....132	-88460.....122	-88608.....59
-88121.....120	-88218.....9	-88363.....132	-88461.....125	-88610.....59
-88122.....120	-88219.....9	-88364.....132	-88462.....122	-88611.....59
-88124.....9	-88220.....9	-88365.....132	-88463.....122	-88612.....59
-88125.....9	-88222.....9	-88366.....132	-88464.....122	-88613.....59
-88126.....9	-88224.....9	-88367.....132	-88465.....122	-88614.....59
-88127.....9	-88225.....9	-88368.....132	-88466.....31	-88615.....59
-88128.....9	-88226.....9	-88369.....132	-88467.....31	-88616.....59
-88129.....9	-88228.....9	-88370.....132	-88468.....31	-88618.....59
-88131.....9	-88230.....9	-88371.....132	-88469.....31	-88619.....59
-88132.....9	-88231.....9	-88372.....132	-88470.....31	-88620.....59
-88133.....9	-88233.....9	-88373.....132	-88471.....31	-88621.....59
-88134.....9	-88235.....9	-88374.....132	-88472.....31	-88622.....59
-88135.....9	-88236.....9	-88375.....132	-88473.....31	-88623.....59
-88136.....9	-88237.....118	-88376.....132	-88474.....31	-88624.....59
-88138.....9	-88238.....118	-88377.....132	-88475.....31	-88626.....59
-88139.....9	-88239.....118	-88378.....136	-88476.....31	-88627.....59
-88140.....9	-88240.....118	-88379.....136	-88477.....31	-88628.....59
-88141.....9	-88241.....118	-88380.....136	-88478.....122	-88629.....59
-88142.....9	-88242.....118	-88381.....136	-88479.....122	-88630.....59
-88143.....9	-88243.....118	-88382.....136	-88480.....122	-88631.....59
-88144.....9	-88244.....118	-88383.....139	-88481.....122	-88632.....59
-88145.....9	-88245.....118	-88384.....139	-88482.....146	-88633.....123
-88146.....9	-88246.....118	-88385.....146	-88483.....146	-88634.....123
-88147.....9	-88247.....118	-88386.....146	-88484.....146	-88635.....123
-88148.....9	-88248.....118	-88387.....146	-88485.....146	-88636.....123
-88149.....9	-88249.....9	-88388.....146	-88486.....146	-88637.....125
-88150.....9	-88250.....9	-88389.....146	-88487.....146	-88638.....123
-88151.....121	-88251.....9	-88390.....146	-88488.....150	-88639.....123
-88152.....121	-88252.....9	-88391.....150	-88489.....146	-88640.....123
-88153.....121	-88253.....9	-88393.....146	-88490.....146	-88641.....123
-88154.....121	-88254.....9	-88394.....146	-88491.....146	-88642.....59
-88155.....125	-88255.....9	-88395.....146	-88492.....146	-88643.....59
-88156.....121	-88256.....9	-88396.....146	-88493.....146	-88644.....59
-88157.....121	-88302.....31	-88397.....146	-88494.....146	-88645.....59
-88158.....121	-88303.....31	-88398.....146	-88495.....146	-88646.....59
-88159.....121	-88304.....31	-88399.....146	-88496.....146	-88647.....59
-88160.....9	-88305.....31	-88400.....146	-88497.....146	-88648.....59
-88161.....9	-88306.....31	-88401.....146	-88498.....146	-88649.....59
-88162.....9	-88307.....31	-88402.....146	-88499.....146	-88650.....59
-88163.....9	-88308.....31	-88403.....146	-88500.....146	-88651.....59
-88164.....9	-88310.....31	-88404.....146	-88501.....31	-88652.....59
-88165.....9	-88311.....31	-88405.....31	-88502.....31	-88653.....59
-88166.....9	-88312.....31	-88406.....31	-88503.....31	-88654.....123
-88167.....9	-88313.....31	-88407.....31	-88504.....31	-88655.....123
-88168.....9	-88314.....31	-88408.....31	-88505.....31	-88656.....123
-88169.....9	-88315.....31	-88409.....31	-88506.....31	-88657.....123
-88170.....9	-88316.....31	-88410.....31	-88507.....31	-88658.....134
-88171.....9	-88318.....31	-88411.....31	-88508.....31	-88659.....134
-88172.....121	-88319.....31	-88412.....31	-88509.....31	-88660.....134
-88173.....121	-88320.....31	-88413.....31	-88510.....31	-88661.....134
-88174.....121	-88321.....31	-88414.....31	-88511.....31	-88662.....134
-88175.....121	-88322.....31	-88415.....31	-88512.....31	-88663.....134
-88176.....144	-88323.....31	-88416.....31	-88513.....120	-88664.....134
-88177.....144	-88324.....31	-88417.....116	-88514.....120	-88665.....134
-88178.....144	-88326.....31	-88418.....116	-88515.....31	-88666.....134
-88179.....144	-88327.....31	-88419.....116	-88516.....31	-88667.....134
-88180.....144	-88328.....31	-88420.....116	-88517.....31	-88668.....134
-88181.....144	-88329.....31	-88423.....120	-88518.....31	-88669.....134
-88182.....150	-88330.....31	-88424.....120	-88519.....31	-88670.....134
-88183.....144	-88331.....31	-88426.....31	-88520.....31	-88671.....134
-88184.....144	-88332.....31	-88427.....31	-88521.....31	-88672.....134
-88185.....144	-88333.....122	-88428.....31	-88522.....31	-88673.....134
-88186.....144	-88334.....122	-88429.....31	-88523.....31	-88674.....134
-88187.....144	-88335.....122	-88430.....31	-88524.....31	-88675.....134
-88188.....144	-88336.....122	-88431.....31	-88525.....31	-88676.....134
-88189.....144	-88337.....125	-88432.....31	-88526.....31	-88677.....134
-88190.....144	-88338.....122	-88433.....31	-88527.....119	-88678.....137
-88191.....144	-88339.....122	-88435.....31	-88528.....119	-88679.....137
-88192.....144	-88340.....122	-88436.....31	-88529.....119	-88680.....137
-88193.....144	-88341.....122	-88437.....31	-88530.....119	-88681.....137
-88194.....144	-88342.....31	-88438.....31	-88531.....119	-88682.....137
-88195.....9	-88343.....31	-88439.....31	-88532.....119	-88683.....139
-88196.....9	-88344.....31	-88440.....31	-88533.....31	-88684.....139
-88197.....9	-88345.....31	-88442.....31	-88534.....31	-88685.....147
-88198.....9	-88346.....31	-88443.....31	-88535.....31	-88686.....147
-88199.....9	-88347.....31	-88444.....31	-88536.....31	-88687.....147
-88200.....9	-88348.....31	-88445.....31	-88537.....31	-88688.....147
-88201.....9	-88349.....31	-88446.....31	-88538.....31	-88689.....147
-88202.....9	-88350.....31	-88447.....31	-88539.....119	-88690.....147
-88203.....9	-88351.....31	-88448.....31	-88540.....119	-88691.....150
-88204.....9	-88352.....31	-88450.....31	-88541.....119	-88693.....147
-88205.....9	-88353.....31	-88451.....31	-88542.....119	-88694.....147
	-88354.....122	-88452.....31	-88543.....119	-88695.....147

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Cat.No. INDEX

5020

-88696	147	-88791	147	-89072	133	-89172	122	-89287	123
-88697	147	-88792	147	-89073	133	-89173	122	-89288	49
-88698	147	-88793	147	-89074	137	-89174	122	-89289	49
-88699	147	-88794	147	-89075	137	-89175	122	-89290	49
-88700	147	-88795	147	-89076	137	-89176	147	-89291	49
-88701	147	-88796	147	-89077	137	-89177	147	-89292	49
-88702	147	-88797	147	-89078	137	-89178	147	-89293	49
-88703	147	-88798	147	-89079	139	-89179	147	-89294	49
-88704	147	-88799	147	-89080	139	-89180	147	-89295	49
-88705	59	-88800	147	-89081	147	-89181	147	-89296	49
-88706	59	-88801	59	-89082	147	-89182	150	-89297	49
-88707	59	-88802	59	-89083	147	-89183	147	-89298	49
-88708	59	-88803	59	-89084	147	-89184	147	-89299	49
-88709	59	-88804	59	-89085	147	-89185	147	-89300	123
-88710	59	-88805	59	-89086	147	-89186	147	-89301	123
-88711	59	-88806	59	-89087	150	-89187	147	-89302	123
-88712	59	-88807	59	-89088	147	-89188	147	-89303	123
-88713	59	-88808	59	-89089	147	-89189	147	-89304	133
-88714	59	-88809	59	-89090	147	-89190	147	-89305	133
-88715	59	-88810	59	-89091	147	-89191	147	-89306	133
-88716	59	-88811	59	-89092	147	-89192	147	-89307	133
-88717	117	-88812	59	-89093	147	-89193	147	-89308	133
-88718	117	-88813	120	-89094	147	-89194	147	-89309	133
-88719	117	-88814	120	-89095	147	-89195	41	-89310	133
-88720	117	-89001	41	-89096	147	-89196	41	-89311	133
-88721	117	-89002	41	-89097	147	-89197	41	-89312	133
-88722	120	-89003	41	-89098	147	-89198	41	-89313	133
-88723	120	-89004	41	-89099	147	-89199	41	-89314	133
-88724	120	-89005	41	-89100	147	-89200	41	-89315	133
-88725	59	-89006	41	-89101	41	-89201	41	-89316	133
-88726	59	-89007	41	-89102	41	-89202	41	-89317	133
-88727	59	-89008	41	-89103	41	-89203	41	-89318	133
-88728	59	-89009	41	-89104	41	-89204	41	-89319	133
-88729	59	-89010	41	-89105	41	-89205	41	-89320	133
-88730	59	-89011	41	-89106	41	-89206	41	-89321	133
-88731	59	-89012	41	-89107	41	-89207	120	-89322	133
-88732	59	-89013	41	-89108	41	-89208	120	-89323	133
-88733	59	-89014	41	-89109	41	-89209	41	-89324	137
-88734	59	-89015	41	-89110	41	-89210	41	-89325	137
-88735	59	-89016	41	-89111	41	-89211	41	-89326	137
-88736	59	-89017	41	-89112	41	-89212	41	-89327	137
-88737	59	-89018	41	-89113	117	-89213	41	-89328	137
-88738	59	-89019	41	-89114	117	-89214	41	-89329	139
-88739	59	-89020	41	-89115	117	-89215	41	-89330	139
-88740	59	-89021	41	-89116	120	-89216	41	-89331	148
-88741	59	-89022	41	-89117	120	-89217	41	-89332	148
-88742	59	-89023	41	-89118	41	-89218	41	-89333	148
-88743	59	-89024	41	-89119	41	-89219	41	-89334	148
-88744	59	-89025	41	-89120	41	-89220	41	-89335	148
-88745	59	-89026	41	-89121	41	-89221	41	-89336	148
-88746	59	-89027	41	-89122	41	-89222	41	-89337	150
-88747	59	-89028	122	-89123	41	-89223	41	-89338	148
-88748	59	-89029	122	-89124	41	-89224	41	-89339	148
-88749	59	-89030	122	-89125	41	-89225	41	-89340	148
-88750	59	-89031	122	-89126	41	-89226	41	-89341	148
-88751	59	-89032	122	-89127	41	-89227	119	-89342	148
-88752	59	-89033	125	-89128	41	-89228	119	-89343	148
-88753	59	-89034	122	-89129	41	-89229	119	-89344	148
-88754	59	-89035	122	-89130	41	-89230	119	-89345	148
-88755	59	-89036	122	-89131	41	-89231	119	-89346	148
-88756	59	-89037	122	-89132	41	-89232	119	-89347	148
-88757	123	-89038	41	-89133	41	-89233	49	-89348	148
-88758	123	-89039	41	-89134	41	-89234	49	-89349	148
-88759	123	-89040	41	-89135	41	-89235	49	-89350	148
-88760	123	-89041	41	-89136	41	-89236	49	-89351	49
-88761	125	-89042	41	-89137	41	-89237	49	-89352	49
-88762	123	-89043	41	-89138	41	-89238	49	-89353	49
-88763	123	-89044	41	-89139	41	-89239	49	-89354	49
-88764	123	-89045	41	-89140	41	-89240	49	-89355	49
-88765	123	-89046	41	-89141	41	-89241	49	-89356	49
-88766	59	-89047	41	-89142	41	-89242	49	-89357	49
-88767	59	-89048	41	-89143	41	-89243	49	-89358	49
-88768	59	-89049	41	-89144	41	-89244	49	-89359	49
-88769	59	-89050	122	-89145	41	-89245	49	-89360	49
-88770	59	-89051	122	-89146	41	-89246	49	-89361	49
-88771	59	-89052	122	-89147	41	-89247	49	-89362	49
-88772	59	-89053	122	-89148	41	-89248	49	-89363	117
-88773	59	-89054	133	-89149	41	-89249	49	-89364	117
-88774	59	-89055	133	-89150	41	-89250	49	-89365	117
-88775	59	-89056	133	-89151	122	-89251	49	-89366	117
-88776	59	-89057	133	-89152	122	-89252	49	-89367	117
-88777	59	-89058	133	-89153	122	-89253	49	-89368	117
-88778	123	-89059	133	-89154	122	-89254	49	-89369	120
-88779	123	-89060	133	-89155	125	-89255	49	-89370	120
-88780	123	-89061	133	-89156	122	-89256	49	-89371	120
-88781	123	-89062	133	-89157	122	-89257	49	-89372	120
-88782	147	-89063	133	-89158	122	-89258	49	-89373	120
-88783	147	-89064	133	-89159	122	-89259	49	-89374	120
-88784	147	-89065	133	-89160	41	-89260	49	-89375	120
-88785	147	-89066	133	-89161	41	-89261	49	-89376	120
-88786	147	-89067	133	-89162	41	-89262	49	-89377	120
-88787	147	-89068	133	-89163	41	-89263	49	-89378	120
-88788	150	-89069	133	-89164	41	-89264	49	-89379	120
-88789	147	-89070	133	-89165	41	-89265	49	-89380	120
-88790	147	-89071	133	-89166	41	-89266	49	-89381	120
				-89167	41	-89267	49	-89382	120
				-89168	41	-89268	49	-89383	120
				-89169	41	-89269	49	-89384	120
				-89170	41	-89270	49		
				-89171	41	-89271	49		
						-89272	49		
						-89273	49		
						-89274	49		
						-89275	49		
						-89276	49		
						-89277	49		
						-89278	123		
						-89279	123		
						-89280	123		
						-89281	123		
						-89282	125		
						-89283	123		
						-89284	123		
						-89285	123		

5020

-89385	49	-89500	102	-89780	136	-89878	7	-72351	158
-89386	49	-89501	102	-89781	136	-89879	7	-72352	158
-89388	49	-89502	102	-89782	139	-89880	7	-73570	158
-89389	49	-89503	102	-89783	139	-89881	7	-77070	158
-89390	49	-89504	102	-89784	143	-89882	7	-77071	158
-89391	49	-89505	102	-89785	143	-89883	121		
-89392	49	-89601	110	-89786	143	-89884	121		
-89393	49	-89602	110	-89787	143	-89885	121		
-89395	49	-89603	110	-89788	143	-89886	121		
-89396	49	-89604	110	-89789	143	-89887	143		
-89397	49	-89605	110	-89790	150	-89888	143		
-89398	49	-89606	111	-89792	143	-89889	143		
-89399	49	-89607	111	-89793	143	-89890	143		
-89400	49	-89608	111	-89794	143	-89891	143		
-89401	123	-89609	110	-89795	143	-89892	143		
-89402	123	-89701	7	-89796	143	-89893	150		
-89403	123	-89702	7	-89797	143	-89894	143		
-89405	125	-89703	7	-89798	143	-89895	143		
-89406	123	-89704	7	-89799	143	-89896	143		
-89407	123	-89705	7	-89800	143	-89897	143		
-89408	123	-89706	7	-89801	143	-89898	143		
-89410	49	-89707	7	-89802	143	-89899	143		
-89411	49	-89709	7	-89803	143	-89900	143		
-89412	49	-89710	7	-89804	7/115	-89901	143		
-89413	49	-89711	7	-89805	7/115	-89902	143		
-89414	49	-89712	7	-89806	7/115	-89903	143		
-89415	49	-89713	7	-89807	7/115	-89904	143		
-89416	49	-89714	7	-89808	7/115	-89905	143		
-89417	49	-89715	7	-89809	7/115	-89906	7/115		
-89418	49	-89717	7	-89810	7/115	-89907	7/115		
-89419	49	-89718	7	-89811	7/115	-89908	7/115		
-89420	49	-89719	7	-89812	7/115	-89909	7/115		
-89421	49	-89720	7	-89813	7/115	-89910	7/115		
-89422	123	-89721	7	-89814	7/115	-89911	7/115		
-89423	123	-89722	7	-89815	7/115	-89912	7/115		
-89424	123	-89723	7	-89816	116	-89913	7/115		
-89425	123	-89725	7	-89817	116	-89914	7/115		
-89426	148	-89726	7	-89818	116	-89915	7/115		
-89427	148	-89727	7	-89819	116	-89916	7/115		
-89428	148	-89728	7	-89822	120	-89917	7/115		
-89429	148	-89729	7	-89823	120	-89918	120		
-89430	148	-89730	7	-89824	118	-89919	120		
-89431	148	-89731	7	-89825	118	-89920	7		
-89432	150	-89732	121	-89826	118	-89921	7		
-89433	148	-89733	121	-89827	118	-89922	7		
-89434	148	-89734	121	-89828	118	-89923	7		
-89435	148	-89735	121	-89829	118	-89924	7		
-89436	148	-89736	125	-89831	7	-89925	7		
-89437	148	-89737	121	-89832	7	-89926	7		
-89438	148	-89738	121	-89833	7	-89927	7		
-89439	148	-89739	121	-89834	7	-89928	7		
-89440	148	-89740	121	-89835	7	-89929	7		
-89441	148	-89741	7	-89836	7	-89930	7		
-89442	148	-89742	7	-89837	7	-89931	7		
-89443	148	-89743	7	-89839	7	-89932	7		
-89444	148	-89744	7	-89840	7	-89933	7		
-89445	49	-89745	7	-89841	7	-89934	7		
-89446	49	-89746	7	-89842	7	-89935	7		
-89447	49	-89747	7	-89843	7	-89936	7		
-89448	49	-89748	7	-89844	7	-89937	7		
-89449	49	-89749	7	-89845	7	-89938	7		
-89450	49	-89750	7	-89847	7	-89939	7		
-89451	49	-89751	7	-89848	7	-89940	7		
-89452	49	-89752	7	-89849	7	-89941	7		
-89453	49	-89753	121	-89850	7	-89942	7		
-89454	49	-89754	121	-89851	7	-89943	7		
-89455	49	-89755	121	-89852	7	-89944	118		
-89456	49	-89756	121	-89853	7	-89945	118		
-89457	120	-89757	131	-89855	7	-89946	118		
-89458	120	-89758	131	-89856	7	-89947	118		
-89459	49	-89759	131	-89857	7	-89948	118		
-89460	49	-89760	131	-89858	7	-89949	118		
-89461	49	-89761	131	-89859	7	-89950	65		
-89462	49	-89762	131	-89860	7	-89951	65		
-89463	49	-89763	131	-89861	7	-89952	67		
-89464	49	-89764	131	-89862	121	-89953	67		
-89465	49	-89765	131	-89863	121				
-89466	49	-89766	131	-89864	121				
-89467	49	-89767	131	-89865	121				
-89468	49	-89768	131	-89866	125				
-89469	49	-89769	131	-89867	121				
-89470	49	-89770	131	-89868	121				
-89471	49	-89771	131	-89869	121				
-89472	49	-89772	131	-89870	121				
-89473	49	-89773	131	-89871	7				
-89474	49	-89774	131	-89872	7				
-89475	49	-89775	131	-89873	7				
-89476	49	-89776	131	-89874	7				
		-89777	136	-89875	7				
		-89778	136	-89876	7				
		-89779	136	-89877	7				

6010

-48600	126
-49200	127
-49201	127
-49202	127
-49210	127
-49211	127
-49250	127
-49251	127
-55100	127
-55110	127
-55300	127
-55310	127
-72321	158



Trademarks

The following trademarks are the property of the listed company and/or its affiliates.

- **GL Sciences Inc. in Japan**

Inertsil
InertSustain
InertSphere
MonoCap
SILFILTER

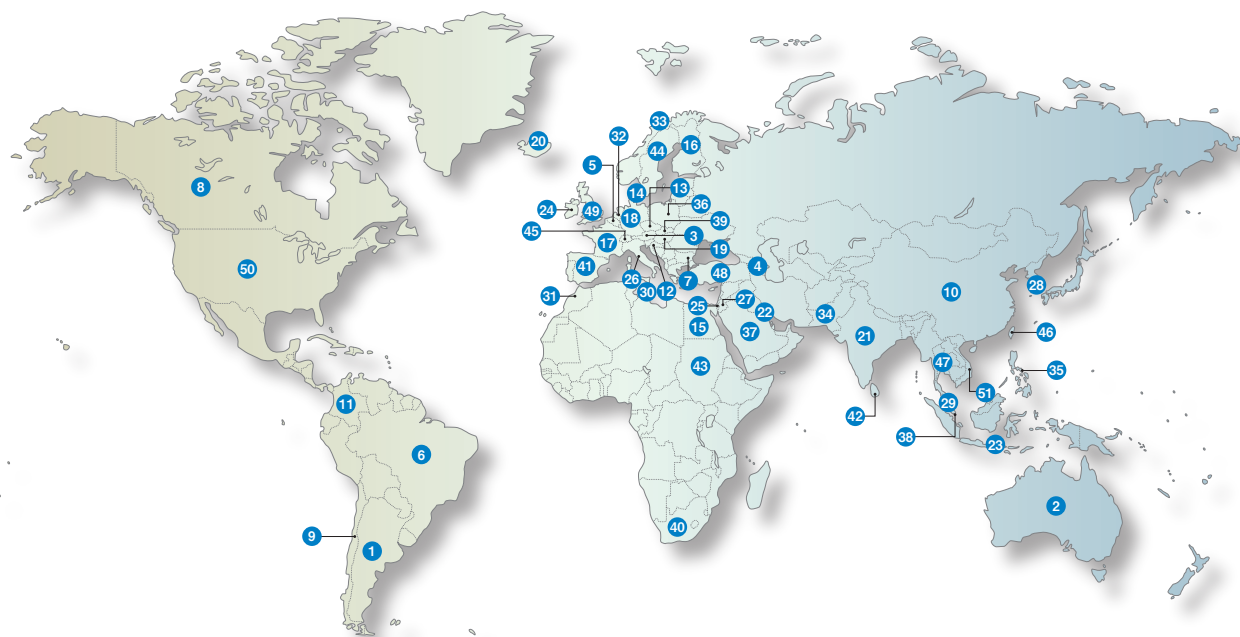
- **AB SCIEX**

QTRAP

- **Waters Technologies Corporation**

UPLC

Worldwide Distribution



1 ARGENTINA		14 DENMARK		27 JORDAN		40 SOUTH AFRICA	
2 AUSTRALIA		15 EGYPT		28 KOREA		41 SPAIN	
3 AUSTRIA		16 FINLAND		29 MALAYSIA		42 SRI LANKA	
4 AZERBAIJAN		17 FRANCE		30 MALTA		43 SUDAN	
5 BELGIUM		18 GERMANY		31 MOROCCO		44 SWEDEN	
6 BRAZIL		19 HUNGARY		32 The NETHERLANDS		45 SWITZERLAND	
7 BULGARIA		20 ICELAND		33 NORWAY		46 TAIWAN	
8 CANADA		21 INDIA		34 PAKISTAN		47 THAILAND	
9 CHILE		22 IRAQ		35 PHILIPPINES		48 TURKEY	
10 CHINA		23 INDONESIA		36 POLAND		49 UNITED KINGDOM	
11 COLOMBIA		24 IRELAND		37 SAUDI-ARABIA		50 UNITED STATES	
12 CROATIA		25 ISRAEL		38 SINGAPORE		51 VIETNAM	
13 CZECH REPUBLIC		26 ITALY		39 SLOVAKIA			

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Special Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

GL Sciences Inc.

22-1 Nishishinjuku 6-chome Shinjuku-ku
Tokyo 163-1130, Japan

GL Sciences, Inc. Japan

22-1 Nishishinjuku 6-chome
Shinjuku, Tokyo, 163-1130, Japan
Phone: +81-3-5323-6620
Fax: +81-3-5323-6621
www.glsciences.com
email: world@gl.co.jp

GL Sciences, Inc. USA

4733 Torrance Blvd. Suite 255
Torrance, Ca. 90503
Phone: 310-265-4424
Fax: 310-265-4425
www.glsciencesinc.com
email: info@glsciences.com

GL Sciences B.V.

De Sleutel 9
5652 AS Eindhoven
The Netherlands
Tel: +31 (0)40 254 95 31
http://www.glsciences.eu/
e-mail: info@glsciences.eu

GL Sciences (ShangHai) Limited

Tower B, Room 2003,
Far East International Plaza,
No.317 XianXia Road,
ChangNing District,
ShangHai, China 200032

International Distributors

Visit our website at
www.glsciences.com/distributors

20190304KH2T



BGB GC|LC
MS|CE

www.bgb-shop.com

Switzerland: BGB Analytik AG • Rohrmattstrasse 4 • 4461 Böckten • Phone +41 61 991 00 46 • Fax +41 61 991 00 25 • sales@bgb-analytik.com

BGB Analytik SA • Route de Pré-Bois 20 • 1215 Genève 15 • Phone +41 22 788 49 43 • Fax +41 22 788 49 45 • sales.fr@bgb-analytik.com

Benelux: BGB Analytik Benelux B.V. • Drielandendreef 42-44 • 3845 CA Harderwijk • Phone +31 341 700270 • Fax +31 341 700271 • sales.benelux@bgb-analytik.com

France: BGB Analytik France S.A.S. • 81 Vie de l'Etraz • 01630 St. Jean de Gonville • Phone +33 450 488567 • Fax +33 450 562378 • sales.fr@bgb-analytik.com

Germany: BGB Analytik Vertrieb GmbH • Mühlestraße 1 • 79539 Lörrach • Phone +49 7623 7173110 • Fax +49 7623 7173199 • sales.de@bgb-analytik.com